S
333.7
N10Li

STATE DOCUMENTS

Northern Great Plains
Resources Program

DOCUMENTS

local impacts of energy resources development in the northern great plains

MONTANA STATE LIBRARY
930 East Lyndale Avenue
Helena, Montana 59601

DEPARTMENT OF
AGRICULTURAL
ECONOMICS
NORTH DAKOTA
STATE UNIVERSITY
FARGO, NORTH DAKOTA

Prepared by:

Arlen G. Leholm
F. Larry Leistritz
Thor A. Hertsgaard

Prepared for:

Northern Great Plains Resources Program
Bldg. 67, Room 820B
Denver Federal Center
Denver, Colorado 80225

SEP 8 1976

MONTANA STATE LIBRARY
S 333.7 N10li c.2 Leholm
Local impacts of energy resources develo
3 0864 00027906 0

LOCAL IMPACTS OF ENERGY RESOURCES DEVELOPMENT IN THE NORTHERN GREAT PLAINS

Final Report
Grant No. 14-01-0001-1825

Arlen G. Leholm
F. Larry Leistritz
Thor A. Hertsgaard

Department of Agricultural Economics
North Dakota State University
Fargo, North Dakota

THIS REPORT WAS PREPARED PURSUANT TO A DIRECTIVE DATED OCTOBER 23, 1973, FROM THE PROGRAM MANAGER, NORTHERN GREAT PLAINS RESOURCES PROGRAM. PUBLICATION OF THE FINDINGS AND RECOMMENDATIONS HEREIN SHOULD NOT BE CONSTRUED AS REPRESENTING EITHER THE APPROVAL OR DISAPPROVAL OF THE SECRETARY OF THE INTERIOR, THE SECRETARY OF AGRICULTURE, THE ADMINISTRATOR OF THE ENVIRONMENTAL PROTECTION AGENCY, OR THE STATES OF MONTANA, NEBRASKA, NORTH DAKOTA, SOUTH DAKOTA, AND WYOMING. THE PURPOSE OF THIS REPORT IS TO PROVIDE INFORMATION AND ASSISTANCE TO THE PROGRAM MANAGEMENT TEAM IN THE PREPARATION OF THE DRAFT INTERIM REPORT ON THE NORTHERN GREAT PLAINS RESOURCES PROGRAM. THE PROGRAM MANAGEMENT TEAM IS RELEASING THIS DRAFT FOR PUBLIC USE WITHOUT CORRECTING INCONSISTENCIES OR REWRITING BECAUSE THE DELAY REQUIRED TO ACCOMPLISH THIS TASK WOULD DELAY THE TIMELY ISSUANCE OF THE REPORTS.

September, 1974

TABLE OF CONTENTS

Page

SUMMARY.. xvi

INTRODUCTION... 1

SECTION I: THE STUDY AREA...................................... 3
  Physical Characteristics..................................... 3
  Coal Resources... 3
  Economic Characteristics..................................... 12

SECTION II: THE NGPRP SCENARIOS................................ 16
  Nature of the Scenarios...................................... 16
    Base Scenario.. 16
    Most Probable Scenario..................................... 21
    Extensive Development Scenario............................. 21
  Recently Announced and Proposed Developments................. 21

SECTION III: PROFILE OF NORTH DAKOTA'S COAL MINE AND ELECTRIC POWER WORK FORCE.. 31
  Introduction... 31
  General Socioeconomic Characteristics........................ 32
    Education.. 34
  Present Employment Characteristics........................... 35
    Job Title.. 35
    Yearly Earnings at Present Job............................. 36
    Transportation... 37
    Satisfaction with Present Job.............................. 37
  Previous Employment Characteristics.......................... 38
    Type of Previous Employer.................................. 38
    Earnings at Last Job....................................... 40
  Job Classification Categories of Coal Mine, Electric Power Plants and Coal Gasification Plants........................... 41

SECTION IV: MERCER COUNTY LABOR SURVEY......................... 48
  Introduction... 48
  General Socioeconomic Characteristics of Heads of Households..... 49
    Yearly Earnings of the Household Heads..................... 50
    Satisfaction with Present Employment....................... 50
  Characteristics of Household Members Over 16 Years of Age........ 51
    Household Head... 51
      Age and Sex.. 51
      Education and Skills..................................... 51
      Occupational Title of Household Head..................... 52
    Spouse of Household Head................................... 52
      Age.. 52
      Education and Skills..................................... 52
      Occupation of Spouse..................................... 54
    All Other Family Members Over 16 Years of Age.............. 54
      Age and Sex.. 54
      Education and Skills..................................... 55
      Occupational Title of All Other Family Members........... 56
    Occupational Title of All Family Members................... 56

Page

Family Members Interest in Coal Related Employment............... 56
Family Members Interest in Employment Created Indirectly as a Result of Coal Development................................ 59
Demand and Supply of Labor....................................... 61
  Demand for Labor... 61
  Supply of Labor.. 64
Household Heads Preference to City Size.......................... 66
Household Heads Preference for Community Services................ 66

SECTION V: ANTICIPATED CHANGES IN STATE AND LOCAL COSTS AND REVENUES.. 69
Introduction... 69
Economic Impacts of Operation of a Coal Gasification Plant and Electric Generating Plant and Associated Mines................. 69
  Assumptions Concerning Operational Employment of a Gasification Plant and Electric Generating Plant and Associated Mines...... 70
  Gross Business Volume Projections.............................. 70
  Total Operational Employment................................... 72
Changes in Public Costs and Revenues............................. 72
  Situation I.. 74
  Situation II... 74
Changes in State Tax Revenues.................................... 75
  Annually Recurring State Tax Revenues.......................... 76
    Annually Recurring State Tax Revenue from Gasification Plant and Associated Mines.. 77
    Annually Recurring State Tax Revenue from Electric Generating Plant and Associated Mine................................... 78
  Nonrecurring State Tax Revenues................................ 80
    Plant Construction... 80
    Business Structure Construction Associated with Operation of a Coal Gasification Plant.................................. 81
    Business Structure Construction Associated with Operation of an Electric Generating Plant............................... 83
    Residential Construction Associated with a Coal Gasification Plant and Electric Generating Plant and Associated Mines.... 84
    Public Facility Construction Associated with a Coal Gasification Plant and Electric Generating Plant and Associated Mines... 86
Changes in Local Tax Revenues.................................... 90
Changes in Local Public Costs.................................... 95
  Education.. 96
  Road and Street Services....................................... 103
  Distribution and Treatment of Water............................ 110
  Waste Water System and Waste Water Treatment................... 112
  Solid Waste Handling and Disposal.............................. 115
  Police and Fire Protection Services............................ 116
  Local Government Costs... 118
  Social Services.. 121
  Other Services... 122
Comparisons of Costs and Revenues................................ 122

TABLE OF CONTENTS (CONT.)

Page

SECTION VI, APPENDIX A, TABLES AND FIGURES 124
  Introduction 124
  Study Area 124
  Population Characteristics 124
    Race 126
    Education 126
    Income and Earnings 126
    Labor Force and Employment 127
    Transportation 128
  Community Infrastructure 129
    Housing 129
    Hospital and Nursing Home Facilities 129
    Water and Sewer Systems 129

APPENDIX B: ELECTRIC POWER PLANT AND COAL MINE WORK FORCE QUESTIONNAIRE 203

APPENDIX C: SURVEY OF HEAD OF HOUSEHOLDS IN MERCER COUNTY 207

LIST OF TABLES

Table Page

1. Land and Water Area in Dunn, McLean, Mercer, and Oliver Counties 5
2. Estimated Original Strippable Lignite Reserves and Lignite Resources in North Dakota 10
3. Total Employment and Farm Employment by County (Dunn, McLean, Mercer, Oliver) and State 13
4. Employment by Economic Sector, Dunn, McLean, Mercer, and Oliver Counties, and State Total, 1971 15
5. Base Scenario 17
6. Most Probable Scenario 22
7. Extensive Development Scenario 26
8. Location of Coal Industry Employee Residences 32
9. Years at Present Address 33
10. Previous Location of Residence 33
11. Formal Education of Employees 34
12. Time Spent in Vocational Training 34
13. Type of Vocational Training 35
14. Present Coal Industry Job Titles 36
15. Yearly Earnings of North Dakota's Coal Industry 37
16. Name or Type of Previous Employer 38
17. Job Title of Previous Employment 39
18. Reason for Leaving Previous Employment 40
19. Earnings at Last Job 41
20. Manning Table for a Five Million Ton Strip Mine in North Dakota 42
21. Expected Staffing Patterns for Steam-Electric Generating Plants 43
22. Personnel Requirements for a 250 MMSCFD Coal Gasification Plant 45

Table Page

23. Yearly Earnings of the Household Head 50

24. Type of Vocational Training of Household Head 51

25. Special Job Skills of Household Heads 52

26. Occupation Title of Household Head 53

27. Special Job Skills of Spouse 53

28. Occupational Title of Spouse 54

29. Special Job Skills of All Other Household Members 55

30. Type of Vocational Training of All Other Household Members . . 56

31. Occupational Title of All Other Household Members 57

32. Occupational Title of All Household Members 58

33. Family Members Interested in Coal Industry Employment 58

34. Type of Coal Related Job Family Members Indicated an Interest . 59

35. Availability of Family Members Interested in Coal Industry Employment 59

36. Family Member's Interest in Employment Created Indirectly as a Result of Coal Development 60

37. Type of Indirect Coal Related Job Family Members Indicated an Interest 60

38. Availability of Family Members Interested in Employment Indirectly Related to Coal Development 61

39. Employed Persons 16+ By Major Occupational Category and Sex for Total of Burleigh, Cass, Ward, Stark, and total of Mercer, Dunn, Oliver, McLean Counties, North Dakota, 1970 62

40. Employed Persons 14+ By Major Occupational Category and Sex for Total of Burleigh, Cass, Ward, Stark, and total of Mercer, Dunn, Oliver, McLean Counties, North Dakota, 1960 63

41. Population, Employment, and Estimate of Potential and Available Labor Force in Dunn, McLean, Mercer, and Oliver Counties, 1970 65

42. Household Heads Preference of City Size 66

43. Household Head Preference for Community Services 67

Table Page

44. Interdependence Coefficients for Expenditures to Sectors 4 (construction), 8 (Retail Trade), and 12 (Households) 70

45. Projected Gross Business Volume of Economic Sectors Resulting From Expenditures for Gasification Plant and Mine Operation (Based on 1972 Prices) 71

46. Projected Gross Business Volume of Economic Sectors Resulting From Expenditures for Electric Generating Plant and Mine Operation (Based on 1972 Prices) 72

47. Projected Total (Direct and Indirect) Employment Resulting From Gasification and Electric Generating Plant and Mine Operation . 73

48. Annual Expenditures for Gasification Plant Operation and Estimated Annual Gross Business Volume of Selected Sectors Resulting From Those Expenditures, Gasification Plant and Associated Mine and Pipeline (1,000 Dollars, 1972 Prices) . . . 77

49. Gross Business Volumes, Tax Estimators, and Estimated Annual Tax Revenues, By Sector and Type of Tax, Gasification Plants and Related Mine and Pipeline 78

50. Annual Expenditures for Electric Generating Plant Operation and Estimated Annual Gross Business Volume of Selected Sectors Resulting From Those Expenditures: Electric Generating Plant and Associated Mine (1,000 Dollars, 1972 Prices) 79

51. Gross Business Volumes, Tax Estimators, and Estimated Annual Tax Revenues, By Sector and Type of Tax, Electric Generating Plant and Related Mine 80

52. Interdependence Coefficients for Selected Sectors and Gross Business Volumes Generated in Those Sectors by $6.101 Million Expenditures to the Construction Sector 82

53. Gross Business Volumes, Tax Estimators, and Estimated Tax Revenues, By Sector and Type of Tax From Construction of $6.101 Million of New Business Structures 82

54. Interdependence Coefficients for Selected Sectors and Gross Business Volumes Generated in Those Sectors By 2.896 Million Expenditures to the Construction Sector 83

55. Gross Business Volumes, Tax Estimators, and Estimated Tax Revenues, By Sector and Type of Tax From Construction of 2.896 Million of New Business Structures 84

56. Estimated Expenditures for Construction of Houses of Apartments or Purchase of Trailers for a Coal Gasification Plant and Electric Generating Plant 85

Table Page

57. Estimated Expenditures for Construction and Estimated Gross Business Volume of Selected Sectors Resulting From the Expenditures, By Settlement Situation, and By Type of Housing (Million Dollars, 1972 Prices) 87

58. Estimated Expenditures for Purchase of Trailers and Estimated Gross Business Volume of Selected Sectors Resulting From Expenditures, By Settlement (Million Dollars, 1972 Prices) 88

59. Tax Estimators, Estimated Gross Business Volumes, and Estimated "One-Time" State Tax Revenues, By Sector and Type of Tax, Resulting From Construction of Houses or Apartments or From Sale of Trailers, By Settlement Situation and By Type of Housing for a Coal Gasification Plant 89

60. Tax Estimators, Estimated Gross Business Volumes, and Estimated "One-Time" State Tax Revenues, By Sector and Type of Tax, Resulting From Construction of Houses or Apartments or From Sale of Trailers, By Settlement Situation and By Type of Housing for an Electric Generating Plant 89

61. Estimated Cost of Required Capital Investment in Public Facilities Associated with One Gasification Plant and One Electric Generating Plant and By Settlement Patterns ($1,000, 1972 Prices)91

62. Estimated Expenditures for Construction of Public Facilities for One Gasification Plant and One Electric Generating Plant and Estimated Gross Business Volume of Selected Sectors Resulting From Those Expenditures ($1,000, 1972 Prices) 91

63. Gross Business Volumes, Tax Estimators, and "One-Time" State Tax Revenues, By Sector and Type of Tax, Resulting From Construction of Public Facilities Associated with a Coal Gasification Plant and Alternative Settlement Patterns ($1,000, 1972 Prices) . . . 92

64. Gross Business Volumes, Tax Estimators, and "One-Time" State Tax Revenues, By Sector and Type of Tax, Resulting From Construction of Public Facilities Associated with an Electric Generating Plant and Alternative Settlement Patterns ($1,000, 1972 Prices) . . . 92

65. Estimated Increases in Local Property Tax Revenues Resulting From a Coal Gasification Plant and Other Associated Properties, By Type of Property, Settlement Pattern, and Type of Housing ($1,000, 1972 Prices) 94

66. Estimated Increases in Local Property Tax Revenues Resulting From an Electric Generating Plant and Associated Properties, By Type of Property, Settlement Pattern, and Type of Housing ($1,000, 1972 Prices) 94

67. Total Property Tax Levied and Distribution Among Local Governments in North Dakota, 1972 96

68. Percentage Distribution of Current Expense Per Pupil (Average Daily Membership) in Rural Elementary and High School Districts, North Dakota, School Year 1971-72 98

69. Total and Per Pupil Cost of Education for Mercer County, Fiscal Year 1971-72 98

70. Estimated Present and Projected Expenditures for Education, Alternative Settlement Patterns, One Coal Gasification Plant and One Electric Generating Plant and Induced Employment Increases 100

71. Total Construction Costs of Public Elementary and Secondary Schools By Size of School, U.S.A., 1969 103

72. Estimated Construction Cost of School Expansion Associated with One Gasification Plant and One Electric Generating Plant and Alternative Settlement Patterns 104

73. North Dakota Statewide Average Cost for Maintenance of City Streets in 1972 105

74. Estimated Street Maintenance Cost Before and After City Expansion for Four Gasification Plants and Alternative Settlement Patterns 107

75. Estimated Costs of Street Construction and Updating of Present Streets Associated with One Gasification Plant and One Electric Generating Plant and Alternative Settlement Patterns 109

76. Estimated Per Capita and Total Cost of Water Distribution System and Treatment Facilities Associated with One Gasification Plant and One Electric Generating Plant and Alternative Settlement Patterns 111

77. Estimated Investment Costs for Waste-Water System and Treatment Facilities Associated with One Gasification Plant and One Electric Generating Plant and Alternative Settlement Patterns 114

78. Police Expenditures, Total and Per Capita, For North Dakota Cities With More Than 10,000 Inhabitants, 1971 116

79. Estimated Additional Operational Police and Fire Protection Costs Due to City Expansion Associated With One Gasification Plant and Concentrated Settlement Patterns 117

80. Fire Department Expenditures, Total and Per Capita, For North Dakota Cities With More Than 10,000 Inhabitants, 1971 118

Table Page

81. Estimated Annual Cost of General County Government Functions Associated With One Gasification Plant and One Electric Generating Plant and Alternative Settlement Patterns 120

82. Administrative, Service, and Training Expense For County Welfare Board, State Office and Area Social Service Centers Together With Payments to or for Recipients By Source of Funds, Mercer County, July 1, 1972-June 30, 1973 121

LIST OF FIGURES

Figure No.		Page
1	Four County Study Area	4
2	Mean Annual Precipitation, Inches, and Percent of Years with Less than 16	6
3	Length of Growing Season	7
4	Major Geographical Regions	8
5	Major North Dakota Rivers	9
6	Area of Commercial Lignite Deposits and Location of Major Strippable Lignite Deposits	11
7	Base Scenario--1980	18
8	Base Scenario--1985	19
9	Base Scenario--2000	20
10	Most Probable Scenario--1980	23
11	Most Probable Scenario--1985	24
12	Most Probable Scenario--2000	25
13	Extensive Development Scenario--1980	27
14	Extensive Development Scenario--1985	28
15	Extensive Development Scenario--2000	29

LIST OF APPENDIX TABLES

Table Page

1. Population Change and Net Migration to and from Dunn, McLean, Mercer, and Oliver Counties, North Dakota, 1960 to 1970 131
2. Population Change and Net Migration to and from Burleigh, Morton, and Stark Counties, North Dakota, 1960 to 1970 132
3. Count of Persons by Age and Sex, Dunn, McLean, Mercer, Oliver Counties, and North Dakota State Total, 1970 134
4. Count of Persons by Age and Sex, Burleigh, Morton, Stark Counties, and North Dakota State Total, 1970 135
5. Count of Persons 16+ in the Labor Force by Age Cohort, Dunn, McLean, Mercer, Oliver Counties, and North Dakota State Total, 1970 . . . 136
6. Count of Persons 16+ in the Labor Force by Age Cohort, Burleigh, Morton, Stark Counties, and North Dakota State Total, 1970 . . . 137
7. Population by Race, Dunn, McLean, Mercer, and Oliver Counties, North Dakota, 1960, 1970 Census 138
8. Count of Persons 25 Years Old and Over by Sex and Years of School Completed, Dunn, McLean, Mercer, Oliver Counties, and North Dakota State Total, 1970 139
9. Count of Persons 25 Years Old and Over by Sex and Years of School Completed, Burleigh, Morton, Stark Counties, and North Dakota State Total, 1970 140
10. Count of Persons 3-34 Years Old Enrolled in School by Age, Dunn, McLean, Mercer, Oliver Counties, and North Dakota State Total, 1970 141
11. Count of Persons 3-34 Years Old Enrolled in School by Age, Burleigh, Morton, Stark Counties, and North Dakota State Total, 1970 . . . 142
12. Count of Persons 16-64 Years Old with Less Than 3 Years of College Completed by Sex and by Vocational Training, Dunn, McLean, Mercer, Oliver Counties, and North Dakota State Total, 1970 143
13. Count of Persons 16 to 64 Years Old with Less Than 3 Years of College Completed by Sex and by Vocational Training, Burleigh, Morton, Stark Counties, and North Dakota State Total, 1970 . . . 144
14. Count of Families by Family Income, Dunn, McLean, Mercer, Oliver Counties, and North Dakota State Total, 1970 145
15. Count of Families by Family Income, Burleigh, Morton, Stark Counties, and North Dakota State Totals, 1970 146

Table Page

16. Count and Percentage of Males 16+ Years Old in the Experienced Civilian Labor Force by Earnings and Occupation, Mercer County, North Dakota, 1970 147

17. Count and Percentage of Males 16+ Years Old in the Experienced Civilian Labor Force by Earnings and Occupation, Oliver County, North Dakota, 1970 148

18. Count and Percentage of Males 16+ Years Old in the Experienced Civilian Labor Force by Earnings and Occupation, McLean County, North Dakota, 1970 149

19. Count and Percentage of Males 16+ Years Old in the Experienced Civilian Labor Force by Earnings and Occupation, Dunn County, North Dakota, 1970 150

20. Count and Percentage of Males 16+ Years Old in the Experienced Civilian Labor Force by Earnings and Occupation, Burleigh County, North Dakota, 1970 151

21. Count and Percentage of Males 16+ Years Old in the Experienced Civilian Labor Force by Earnings and Occupation, Morton County, North Dakota, 1970 152

22. Count and Percentage of Males 16+ Years Old in the Experienced Civilian Labor Force by Earnings and Occupation, Stark County, North Dakota, 1970 153

23. Count and Percentage of Males 16+ Years Old in the Experienced Civilian Labor Force by Earnings and Occupation, North Dakota, 1970 154

24. Count and Percentage of Females 16+ Years Old in the Experienced Civilian Labor Force by Earnings and Occupation, Mercer and Oliver Counties, North Dakota, 1970 155

25. Count and Percentage of Females 16+ Years Old in the Experienced Civilian Labor Force by Earnings and Occupation, Dunn and McLean Counties, North Dakota, 1970 156

26. Count and Percentage of Females 16+ Years Old in the Experienced Civilian Labor Force by Earnings and Occupation, Burleigh and Morton Counties, North Dakota, 1970 157

27. Count and Percentage of Females 16+ Years Old in the Experienced Civilian Labor Force by Earnings and Occupation, Stark County and North Dakota State Total, 1970 158

28. Population 16+ by Labor Force Status, Selected Characteristics and Sex, Dunn, McLean, Mercer, Oliver Counties, and North Dakota State Total, 1970 159

Table Page

29. Population 16+ by Labor Force Status, Selected Characteristics and Sex, Burleigh, Morton, Stark Counties, and North Dakota State Total, 1970 160

30. Count of Employed Persons 16+ Years Old by Industry and Sex, Dunn, McLean, Mercer, and Oliver Counties, North Dakota, 1970 . 161

31. Count of Employed Persons 16+ Years Old by Industry and Sex, Burleigh, Morton, and Stark Counties, North Dakota, 1970 . . . 163

32. Employed Persons 16+ Years Old by Occupation, Dunn, McLean, Mercer, and Oliver Counties, North Dakota, 1970 165

33. Employed Persons 16+ Years Old by Occupation, Burleigh, Morton, and Stark Counties, North Dakota, 1970 167

34. Underemployment Estimates by County, Dunn, McLean, Mercer, and Oliver Counties, North Dakota, 1960 170

35. Underemployment Estimates by County, Burleigh, Morton, and Stark Counties, North Dakota, 1960 171

36. Males 16+ by Age and Weeks Worked in 1969, Dunn, McLean, Mercer and Oliver Counties and North Dakota State Total 172

37. Males 16+ by Age and Weeks Worked in 1969, Burleigh, Morton, Stark Counties, and North Dakota State Total 173

38. Females 16+ by Age and Weeks Worked in 1969, Dunn, McLean, Mercer, Oliver Counties, and North Dakota State Total 174

39. Females 16+ by Age and Weeks Worked in 1969, Burleigh, Morton, Stark Counties, and North Dakota State Total. 175

40. Labor Force Participation Rates, Dunn, McLean, Mercer, and Oliver Counties, North Dakota, 1970 176

41. Labor Force Participation Rates, Burleigh, Morton, and Stark Counties, North Dakota, 1970 177

42. Count of Persons at Work During Week of Census by Means of Transportation to Work, Dunn, McLean, Mercer, Oliver Counties, and North Dakota State Total, 1970 178

43. General Housing Characteristics in Dunn, McLean, Mercer, and Oliver Counties, North Dakota, 1970 179

44. General Housing Characteristics in Burleigh, Morton, and Stark Counties, North Dakota, 1970 180

45. Detailed Housing Characteristics in Dunn, McLean, Mercer, and Oliver Counties, North Dakota, 1970 181

Table Page

46. Detailed Housing Characteristics in Burleigh, Morton, and Stark Counties, North Dakota, 1970 183

47. Hospital Facilities by County in 1972, Region 7 of North Dakota 185

48. Hospital Facilities by County in 1972, Region 8 of North Dakota 186

49. Nursing Home Facilities by County in 1973, Region 7 of North Dakota 187

50. Nursing Home Facilities by County in 1973, Region 8 of North Dakota 188

51. Inventory of Municipal Sewage Systems, North Dakota State Region 7, Cities and Villages with 1960 Population of 75 to 10,000 as of September 15, 1972 189

52. Inventory of Municipal Sewage Systems, North Dakota State Region 8, Cities and Villages with 1960 Population of 75 to 10,000 as of September 15, 1972 193

53. Inventory of Municipal and Community Water Systems in North Dakota State Region 7, Cities and Villages with 1960 Population of 75 to 10,000 as of September 1, 1972 196

54. Inventory of Municipal and Community Water Systems in North Dakota State Region 8, Cities and Villages with 1960 Population of 75 to 10,000 as of September 1, 1972 200

LIST OF APPENDIX FIGURES

Figure No. Page

1 Major Highway Systems, Railroad Systems, Towns, and Rivers in Major Coal Impact Area........................ 130

2 Population Change and Net Migration, By Counties, 1960 to 1970.. 133

SUMMARY

The local impact study describes the current socioeconomic characteristics of Mercer County and surrounding area and the possible level of coal development the area may experience under three development alternatives. Mercer County, a sparsely populated, agriculturally based area, was chosen as the specific study area because preliminary information indicates major coal development could occur first in this North Dakota county.

A survey of North Dakota's coal industry provides a description of the work force profiles of the current employees in North Dakota's coal mines and electric generating plants. The results indicate a very stable indigenous work force, the employees have lived an average of 23 years in the community in which they now live. The current coal industry work force is paid better than the average labor force in North Dakota with median incomes between $12,000-$13,000. The average salary increase between the coal industry workers ending salary at their previous job and starting salary with their present energy related company was $2,338. The coal industry work force indicated they were quite satisfied with their present employment.

Surveys of Mercer County were conducted by mail to determine the availability, skills, and attitude of the local labor force towards employment either directly or indirectly related to coal development. Results indicate 28 of 154 family members expressed an interest in a coal related job and 26 of 138 family members expressed an interest in employment created indirectly as a result of coal development.

The report involves the analysis of the impact one 250 MMCFD coal gasification plant and one 1,250 MW electric generating (and associated mines) would have on selected public costs and revenues. The report provides information on the extent to which present and projected revenue sources for public services are sufficient to meet anticipated increases in public costs. Two hypothetical settlement patterns were assumed to reflect the absolute extremes of selected public costs and revenues that could result. Changes in annual local property taxes were estimated to vary from $1.0 million to $2.0 million for operation of a coal gasification plant and $1.1 million to $1.5 million for operation of an electric generating plant. State collectible taxes were estimated to increase by $1.1 million annually for operation of a coal gasification plant and $.5 million annually for operation of an electric generating plant. Recurring expenditures in Mercer County were estimated to increase from $.2 million to $1.5 million annually for operation of a coal gasification plant and from no increase in annually recurring expenditures to $.5 million for operation of an electric generating plant.

It is important to realize that not all costs and revenues were considered in this report. Any conclusions drawn from comparisons of total estimated revenues and expenditures would be inappropriate. However, the range of expenditures and revenues presented in this report may provide a general indication of the impact that could be associated with a coal gasification or electric generating plant.

INTRODUCTION

Development of their natural resources is a major issue confronting North Dakota citizens. The energy crisis has placed this issue in the forefront with the recent interest in development of the coal reserves of the Fort Union Formation in Western North Dakota. Development of the Fort Union coal reserves is expected to contribute significantly in meeting the nation's energy shortage.

Development of the Fort Union coal reserves will result in a sizeable social and economic impact for the state of North Dakota and especially for the communities located near the coal development. Population growth resulting from coal development in the study area will unquestionably create increased needs for public and private services. Uncertainty about the magnitude and nature of these increased needs resulting from coal development has created a major political issue for North Dakota citizens. An understanding of the private and public costs and revenues associated with various levels of coal development would aid the state and local decision makers in planning to minimize the detrimental and maximize the positive impacts associated with each level of coal development. Knowledge of the work force profile of North Dakota's coal industry and the labor characteristics of development area residents will also aid in planning for expanded coal development.

The purpose of this study is to provide a detailed analysis of Mercer County, North Dakota, and the surrounding area in an effort to reveal the nature and magnitude of development impacts which will be experienced by local communities from various levels of coal development. The material summarized in this report is presented in six sections. Section I describes the study area by its economic, physical, topographic, physiographic, geologic (coal reserves), and other general characteristics. Section II reveals the development scenarios prepared by the National Energy Considerations Work Group of the Northern Great Plains Resource Program and discusses other recently planned and anticipated developments in the study area. A work force profile, resulting from a mail survey, of employees in two electric generating plants and three coal mines in North Dakota is summarized in Section III. Section IV summarizes the results of a labor and other general characteristics survey of heads of households in Mercer County. The public revenues associated with operation of one (250 MMCFD) gasification plant and one 1,250 MW electric generating plant complex in Mercer County are discussed in Section V. The public and private costs associated with operation of a (250 MMCFD) gasification plant and one 1,250 MW power plant complex in Mercer County are also discussed in Section V. Section VI includes an extensive review of background socioeconomic characteristics in the major four county study area of Mercer, Dunn, McLean, and Oliver counties (and where appropriate, Burleigh, Morton, and Stark counties). Section VI is included as Appendix A to this report.

SECTION I: THE STUDY AREA

The four west-central North Dakota counties of Dunn, McLean, Mercer, and Oliver comprise the major study area (Figure 1). These four North Dakota counties will be the first to be heavily impacted by coal development. The local impact analysis will concentrate on a case study of Mercer County.

Physical Characteristics

The four counties have a combined land and water area of nearly four million acres (Table 1). Figure 2 illustrates that the area's average annual precipitation ranges from 14 to 16 inches and the area receives less than 16 inches of precipitation in 50 to 60 percent of the years. The growing season (days with minimum temperatures above 32 degrees) averages 126 to 131 days as shown in Figure 3. Figure 4 illustrates the major geographical regions of North Dakota. Except for the northeast corner of McLean County which is in the Drift Prairie, the study area lies in the physiographic region known as the Missouri Plateau. The Missouri Plateau is drained by the Missouri River and its tributaries. The major tributaries of the Missouri River and other major North Dakota rivers are shown in Figure 5. The topography of the area is characterized by gently rolling plains although rough "breaks" occur near the Missouri and Little Missouri Rivers, particularly in Dunn County.

Coal Resources

The lignite resources of western North Dakota are part of the Fort Union coal area that extends northward into Saskatchewan and west and south into Montana, Wyoming, and South Dakota. The 350.9 billion tons of lignite resources in North Dakota comprise 22 percent of the nation's total coal resources.[1] The total strippable reserves in the study area are over 5.6 billion tons (Table 2). Figure 6 indicates both the general area of lignite deposits and the location of major strippable reserves.

---

[1] Brant, R. A., Lignite Resources of North Dakota, U.S. Geological Survey Circular 22G, 1953.

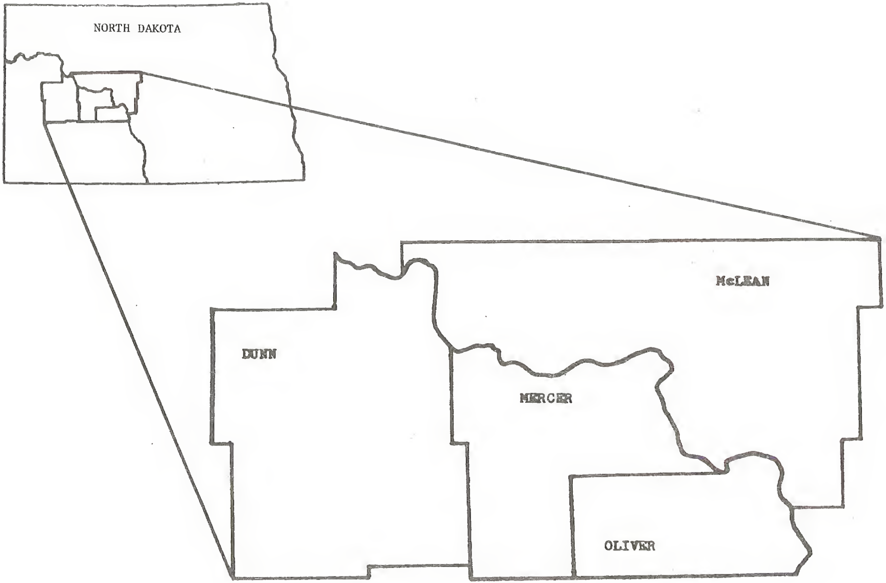


FIGURE 1. FOUR COUNTY STUDY AREA

TABLE 1. LAND AND WATER AREA IN DUNN, MCLEAN, MERCER, AND OLIVER COUNTIES

	WATER AREA				LAND AREA			
COUNTIES	OVER 40 ACRES	UNDER 40 ACRES	TOTAL ACRES	TOTAL SQUARE MILES	TOTAL ACRES	TOTAL SQUARE MILES	TOTAL AREA ACRES	TOTAL AREA SQUARE MILES
DUNN	56,832	0	56,832	89	1,275,008	1,992	1,331,840	2,081
MCLEAN	167,680	6,095	173,775	271	1,315,505	2,056	1,489,280	2,327
MERCER	43,840	956	44,796	70	665,604	1,040	710,400	1,110
OLIVER	5,248	493	5,748	9	460,819	720	466,560	729
TOTAL	273,600	7,544	281,151	439	3,716,936	5,808	3,998,080	6,247

Source: Total area is U.S. Bureau of Census 1970 Land and Water Area. Water Areas over 40 acres include streams 1/8 mile width or more. Water areas under 40 acres are from the State Conservation Needs Inventory, 1970, Soil Conservation Service, USDA.

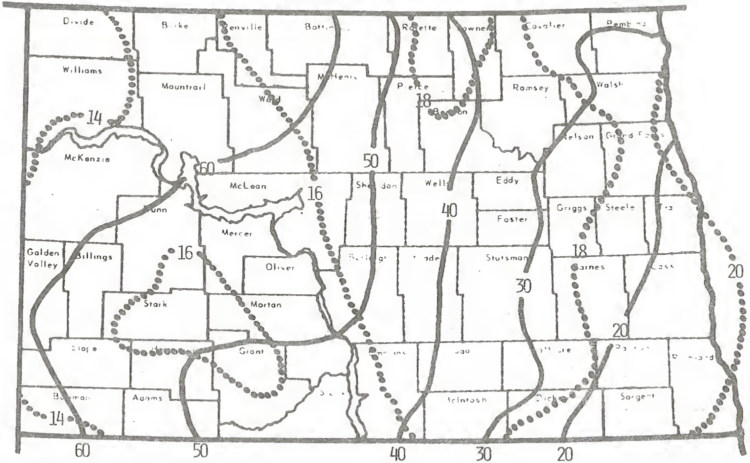


FIGURE 2. MEAN ANNUAL PRECIPITATION, INCHES, AND PERCENT OF YEARS WITH LESS THAN 16 INCHES OF PRECIPITATION

SOURCE: NORTH DAKOTA DEPARTMENT OF PUBLIC INSTRUCTION, PROJECT NORTH DAKOTA, BISMARCK, NORTH DAKOTA

••••• Mean annual precipitation, inches

——— Percent of years with less than 16 inches of precipitation

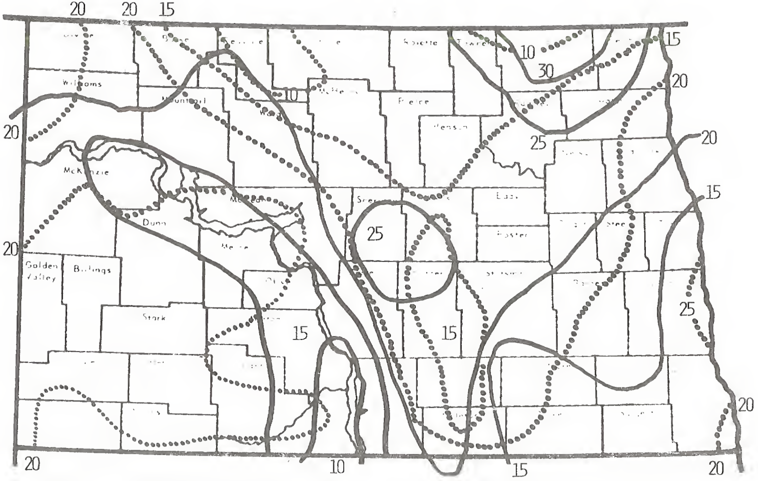


FIGURE 3. LENGTH OF GROWING SEASON

SOURCE: NORTH DAKOTA DEPARTMENT OF PUBLIC INSTRUCTION, PROJECT NORTH DAKOTA, BISMARCK, NORTH DAKOTA.

●●●● Average dates of first killing frost in fall--May

▬ Average dates of last killing frost in spring--September

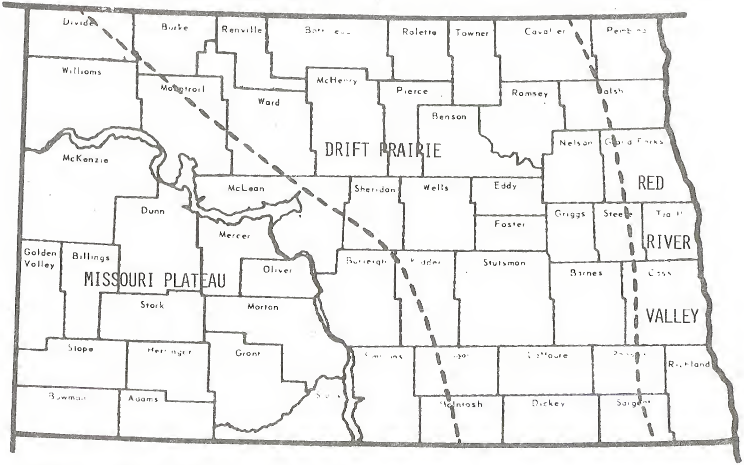


FIGURE 4. MAJOR GEOGRAPHICAL REGIONS

SOURCE: NORTH DAKOTA DEPARTMENT OF PUBLIC INSTRUCTION, PROJECT NORTH DAKOTA, BISMARCK, NORTH DAKOTA

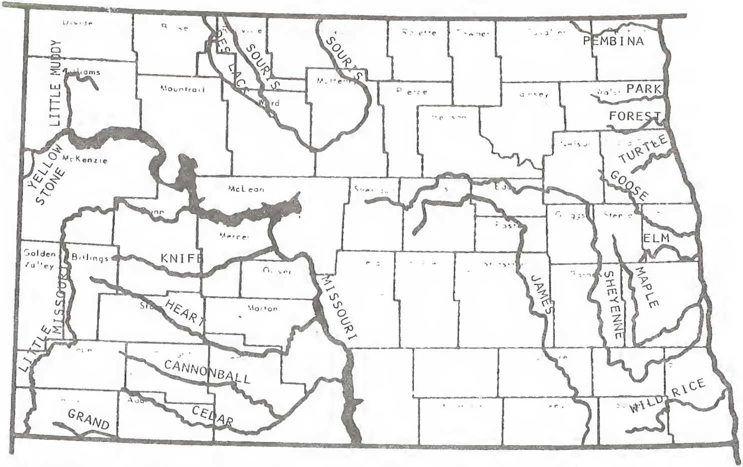


FIGURE 5. MAJOR NORTH DAKOTA RIVERS

SOURCE: NORTH DAKOTA DEPARTMENT OF PUBLIC INSTRUCTION, PROJECT NORTH DAKOTA, BISMARCK, NORTH DAKOTA.

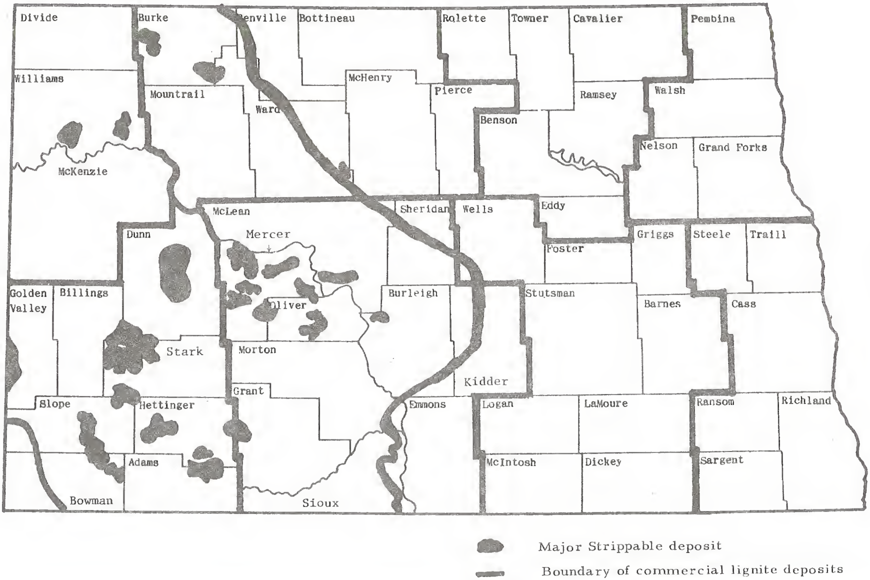
TABLE 2. ESTIMATED ORIGINAL STRIPPABLE LIGNITE RESERVES AND LIGNITE RESOURCES IN NORTH DAKOTA[a]

COUNTY	STRIPPABLE RESERVE	TOTAL RESOURCE
Adams	163	1,857
Billings	1,078	17,718
Bowman	785	7,021
Burke	117	6,610
Burleigh	156	1,157
Divide	137	8,264
Dunn	2,000	71,042
Golden Valley	278	8,319
Grant	115	4,658
Hettinger	980	12,653
McHenry	15	118
McKenzie	825	32,183
McLean	1,009	16,478
Mercer	1,986	29,912
Morton	342	15,251
Mountrail	148	15,378
Oliver	629	17,839
Renville	8	783
Sheridan	0	660
Slope	2,326	20,091
Stark	1,275	25,698
Ward	501	10,286
Williams	1,130	26,935
TOTAL	16,130	350,911

[a] The table lists the counties in North Dakota that have lignite resources. The figures are millions of tons. Original strippable reserve estimates refer to coal seams 5 feet or thicker and overburden of 100 feet or less. Total resources refer to coal seams at least 2½ feet thick and overburden of 1,200 feet or less. The strippable reserve figures for Dunn and Hettinger counties were supplied by industry.

Source: R. A. Brant, Lignite Resources of North Dakota, U.S. Geological Survey Circular 22 G, 1953 or Modified Circular 22 G, March, 1974.

FIGURE 6. AREA OF COMMERCIAL LIGNITE DEPOSITS AND LOCATION OF MAJOR STRIPPABLE LIGNITE DEPOSITS



Commercial mining of lignite is not a new phenomena for the residents of the study area. Mining of coal underground has taken place since the early 1900's. The 1925 State of North Dakota Coal Mine Inspection Department report lists coal production at 273,534 tons from 17 mines in Mercer County, 110,515 tons came from 22 mines in McLean County, 5 mines in Oliver produced 3,400 tons and 5,939 tons were produced from 8 mines in Dunn County. Commercial strip mining of lignite in North Dakota is currently concentrated in Mercer and Oliver counties with most of the coal being used to fuel steam-electric power plants located in the same counties. The initial interest in expanded coal development occurring in the study area may be due to their close proximity to the Missouri River and its tributaries (Figure 5). Large quantities of water are required for cooling purposes in both steam-electric power plants and coal gasification plants and the Missouri River is the major source of water supply in western North Dakota.

Economic Characteristics

The economy of the study area is based primarily on livestock and small grain production. Table 3 illustrates that in 1971 agriculture employment in the study area was almost 40 percent of the total employment. Dunn County had the highest percentage of farm employment with 57.1 percent, while Mercer had the lowest percentage of the study area with 31.4 percent, still much above the 21.2 percent average for state farm employment.

While a high percentage of employment is based on agriculture, the study area's farm employment decreased from 44.6 percent in 1967 to 39.9 percent in 1971. Agriculture employment in the study area declined from 4,431 in 1967 to 4,012 in 1971. Farm numbers in the study area declined 26 percent from 4,600 in 1950 to 3,400 in 1969.[2]

---

[2] Bureau of the Census, U.S. Census of Agriculture, North Dakota: 1950, 1969, Washington, D.C., U.S. Government Printing Office, 1950, 1969.

TABLE 3. TOTAL EMPLOYMENT AND FARM EMPLOYMENT[a] BY COUNTY (DUNN, MCLEAN, MERCER, OLIVER) AND STATE

COUNTY	DUNN	MERCER	MCLEAN	OLIVER	FOUR COUNTY TOTAL	STATE TOTAL
1971						
TOTAL EMPLOYMENT	1,700	2,564	4,832	947	10,043	274,036
FARM EMPLOYMENT	970	806	1,731	505	4,012	58,080
FARM AS % OF TOTAL	57.1	31.4	35.8	53.3	39.9	21.2
1970						
TOTAL EMPLOYMENT	1,708	2,512	4,806	1,152	10,178	270,760
FARM EMPLOYMENT	966	807	1,722	503	3,998	57,540
FARM AS % OF TOTAL	56.6	32.1	35.8	43.6	39.3	21.3
1969						
TOTAL EMPLOYMENT	1,729	2,536	4,723	1,132	10,120	266,287
FARM EMPLOYMENT	984	823	1,754	512	4,073	58,598
FARM AS % OF TOTAL	56.9	32.5	37.1	45.2	40.2	22.0
1968						
TOTAL EMPLOYMENT	1,708	2,492	4,588	919	9,707	263,997
FARM EMPLOYMENT	1,030	851	1,847	534	4,262	61,762
FARM AS % OF TOTAL	60.3	34.1	40.3	58.1	43.9	23.4
1967						
TOTAL EMPLOYMENT	1,766	2,615	4,649	915	9,945	267,078
FARM EMPLOYMENT	1,074	874	1,931	552	4,431	64,574
FARM AS % OF TOTAL	60.8	33.4	41.5	60.3	44.6	24.2

[a] Includes farm wage workers and farm proprietors

Source: Bureau of Economic Analysis, taken from print out of Regional Economic Information System, October 20, 1973. Unpublished

Employment by economic sector is shown in Table 4. Substantial employment occurs in the service, trade, and federal government sectors. Employment in the mining and construction sectors will increase significantly as will most sectors, if the anticipated coal development occurs in the study area. Coal development could change the predominately agricultural-based study area economy, characterized by declining population, to a burgeoning industrialized area characterized by rapid population growth.

TABLE 4. EMPLOYMENT[a] BY ECONOMIC SECTOR, DUNN, MCLEAN, MERCER, AND OLIVER COUNTIES, AND STATE TOTAL, 1971

SECTOR	DUNN	MCLEAN	MERCER	OLIVER	FOUR COUNTY TOTAL	STATE TOTAL
AGRICULTURE	137	256	74	69	536	10,903
FEDERAL GOVERNMENT	49	294	55	19	417	22,381
STATE AND LOCAL GOVERNMENT	269	710	325	158	1,462	44,185
MANUFACTURING	1	50	32	0	83	10,336
MINING	(D)	(D)	185	(D)	185	1,637
CONSTRUCTION	39	212	85	22	358	10,763
TRANSPORTATION, COMMUNICATIONS AND PUBLIC UTILITIES	21	78	190	87	376	11,841
TRADE	75	491	306	(D)	872	46,261
FINANCE, INSURANCE AND REAL ESTATE	(D)	43	26	0	69	6,924
SERVICES	50	496	176	7	729	33,506
OTHER	10	(D)	40	(D)	50	1,014
TOTAL EMPLOYMENT	651	2,630	1,494	362	5,137	199,751

[a] Excludes proprietors

(D) Not shown to avoid disclosure of data for individual reporting units.

Source: U S Department of Commerce, Bureau of Economic Analysis
Regional Economics Information System, Unpublished data, August, 1973.

SECTION II: THE NGPRP SCENARIOS

The Northern Great Plains Resource Program (NGPRP) has developed three development alternatives or scenarios. These scenarios are intended to provide a basis for evaluation of the long-term energy development alternatives for North Dakota. The three development scenarios, supplemented by the coal companies announced development plans, have provided a basis for evaluating the magnitude of the probable alternative impacts on the study area.

Nature of the Scenarios

The NGPRP National Energy Considerations Work Group has labeled the three scenarios "The Base Scenario," "The Most Probable Scenario," and "The Extensive Development Scenario."[3] Each scenario is projected for years 1980, 1985, and 2000. Each scenario assumes the completion of currently announced coal mines and generating plants. The following section will briefly describe each of the scenarios and its application to the study area.

Base Scenario (Scenario I)

No development of coal resources other than those necessary to meet regional demand and previously committed demand is assumed.

Scenario I, as it applies to the study area, indicates limited energy development beyond 1980. The Base Scenario assumes a 1,200 megawatt steam-electric plant in Mercer County to be in operation by the year 2000 (Table 5). Figures 7, 8, and 9 show the development location (by county) of the steam-electric plants and mines as listed under the Base Scenario. Present and proposed facilities which will be operational by 1980 are also shown. The plant size and other related data are included in Table 5 for 1980, 1985, and 2000.

---

[3] "Northern Great Plains Resources Program: National and Regional Energy Considerations," mimeographed, 1974.

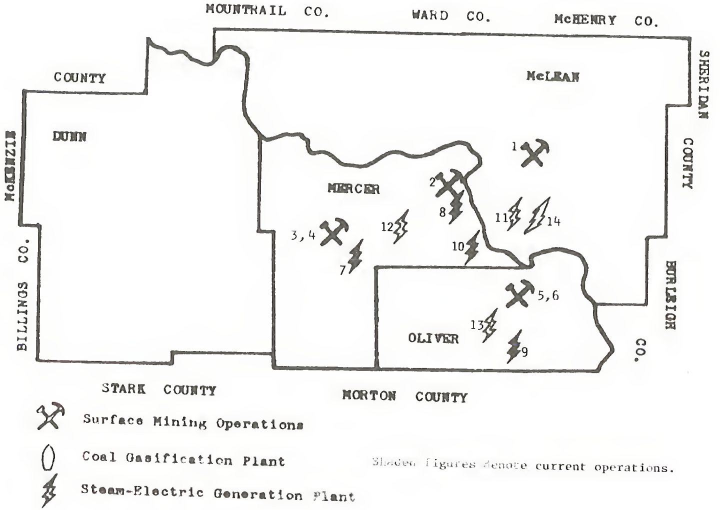
TABLE 5. BASE SCENARIO

Map Ref. No.	County	Target Year	Operation or Plant	Production (tons) or Capacity (megawatts)[a]
1	McLean	Present	Mine	16,193
2	Mercer	Present	Mine	1,269,607
3	Mercer	Present	Mine	1,473,096
4	Mercer	Present	Mine	965,751
5	Oliver	Present	Mine	1,440,620
6	Oliver	Present	Mine	303
7	Mercer	Present	Steam-Electric	13.5
8	Mercer	Present	Steam-Electric	215.7
9	Oliver	Present	Steam-Electric	234.6
10	Mercer	Present	Steam-Electric	172.0
11[b]	McLean	1978-79	Steam-Electric	487.0
12	Mercer	1975	Steam-Electric	438.0
13	Oliver	1977	Steam-Electric	435.0
14[b]	McLean	1978-79	Steam-Electric	487.0
15	Mercer	2000	Steam-Electric	1,200.0

[a] In the case of a mine, production is in tons. In the case of a steam-electric plant, capacity is in megawatts (nameplate capacity). Only electrical generation plants utilizing lignite are considered.

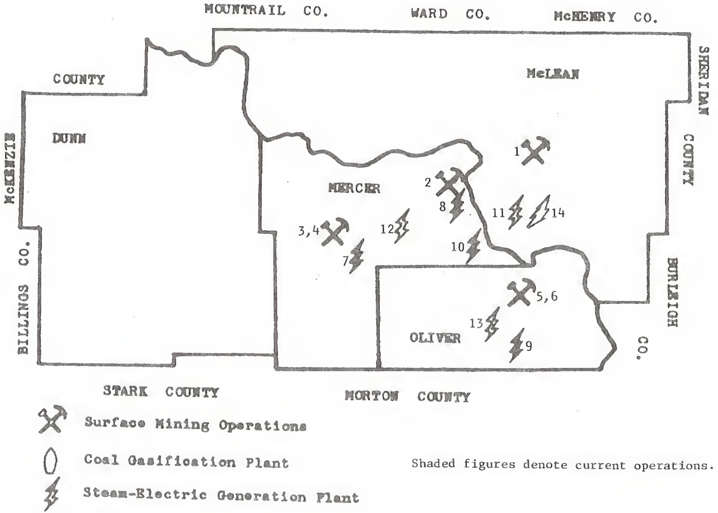
[b] These two plants constitute approximately one 900 MW electric.

FIGURE 7. BASE SCENARIO--1980



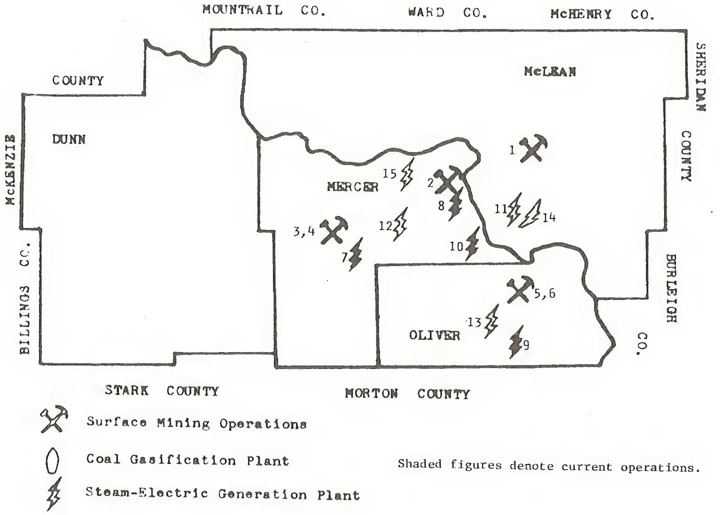
Shaded figures denote current operations.

FIGURE 8. BASE SCENARIO--1985



Shaded figures denote current operations.

FIGURE 9. BASE SCENARIO--2000



Shaded figures denote current operations.

Most Probable Scenario (Scenario II)

This is the level of coal development most likely to occur, embodying large coal fired generating plants, coal conversion plants, and out of state exports of coal, particularly to the electric generation sector of the market areas.

This scenario indicates substantial increase in electric power generation and the implementation of seven gasification (250 MMCFD) plants by the year 2000 (Table 6). Figures 10, 11, and 12 illustrate the location of present and proposed mines and plants for the most probable scenario for 1980, 1985, and 2000, respectively.

Extensive Development Scenario (Scenario III)

This scenario represents a national crisis situation with major reduction in oil impacts, major restrictions in natural gas imports from Canada, and major lag in nuclear generating capacity.

Under Scenario III development of coal gasification plants increases dramatically with four plants operational by 1980, two more by 1985, and nine more gasification plants by the year 2000 (Table 7). Electric generation remains the same as implemented under Scenario II. A six million ton per year export mine site begins producing in Oliver County by the year 2000. Figures 13, 14, and 15 illustrate the location of the mines and plants for the Extensive Development Scenario for 1980, 1985, and 2000, respectively.

Recently Announced and Proposed Developments

Several companies have announced plans for development in the study area. The Michigan - Wisconsin Company has received approval of a water permit for one coal gasification plant to be located in Mercer County that could be on line by 1980. This firm has intentions of developing three more coal gasification plants, pending approval of water permits, all likely to be located in Mercer County.

TABLE 6. MOST PROBABLE SCENARIO

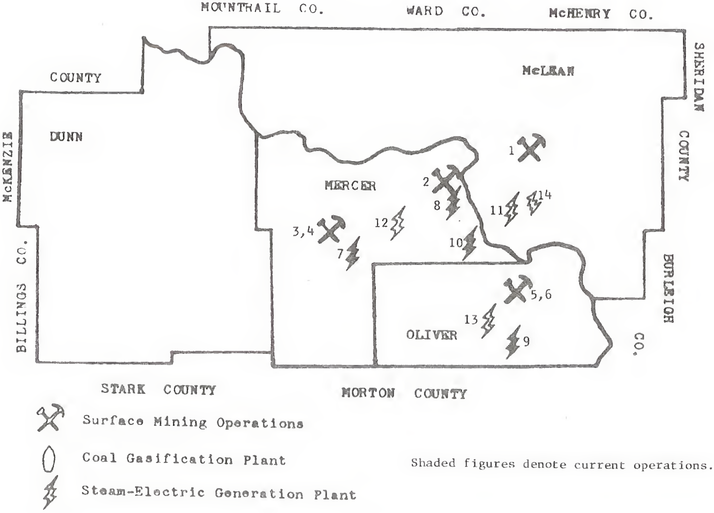
Map Ref. No.	County	Target Year	Operation or Plant	Production (tons) or Capacity (megawatts)[a]
1	McLean	Present	Mine	16,193
2	Mercer	Present	Mine	1,269,607
3	Mercer	Present	Mine	1,473,096
4	Mercer	Present	Mine	965,751
5	Oliver	Present	Mine	1,440,620
6	Oliver	Present	Mine	303
7	Mercer	Present	Steam-Electric	13.5
8	Mercer	Present	Steam-Electric	215.7
9	Oliver	Present	Steam-Electric	234.6
10	Mercer	Present	Steam-Electric	172.0
11[b]	McLean	1978-79	Steam-Electric	487.0
12	Mercer	1975	Steam-Electric	438.0
13	Oliver	1977	Steam-Electric	435.0
14[b]	McLean	1978-79	Steam-Electric	487.0
15	Mercer	1985	Gasification	250.0
16	Dunn	1985	Gasification	250.0
17	Oliver	2000	Steam-Electric	1,250.0
18	Mercer	2000	Steam-Electric	1,250.0
19	Dunn	2000	Gasification	250.0
20	Dunn	2000	Gasification	250.0
21	Mercer	2000	Gasification	250.0
22	McLean	2000	Gasification	250.0
23	McLean	2000	Gasification	250.0

---

[a] In the case of a mine, production is in tons. For a steam-electric plant, capacity is stated in megawatts (nameplate capacity). Only electric generation plants utilizing lignite are considered. For all gasification plants, capacity is assumed to be 250 million cubic feet per day.

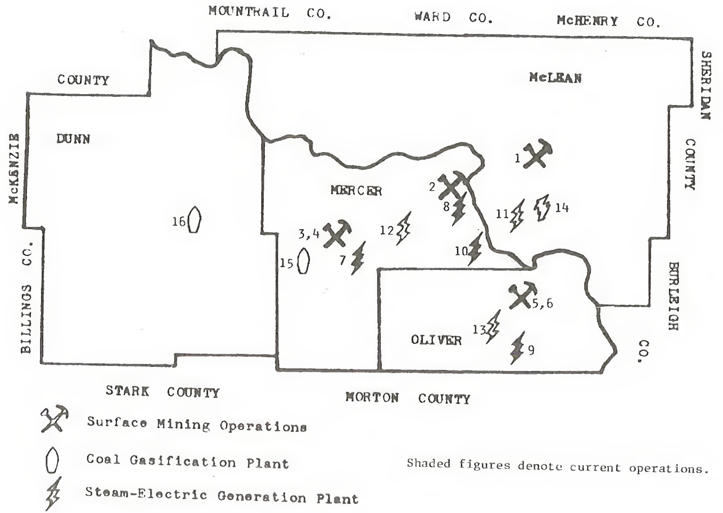
[b] These two plants constitute approximately one 900 MW electric.

FIGURE 10. MOST PROBABLE SCENARIO--1980



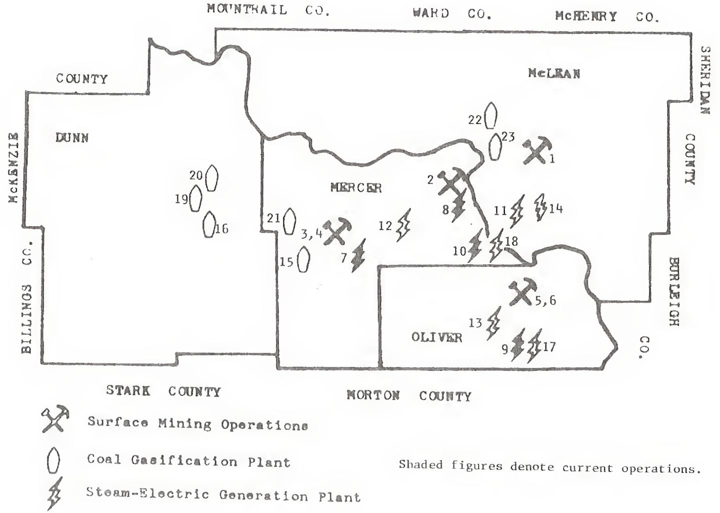
Shaded figures denote current operations.

FIGURE 11. MOST PROBABLE SCENARIO--1985



Shaded figures denote current operations.

FIGURE 12. MOST PROBABLE SCENARIO--2000



Shaded figures denote current operations.

TABLE 7. EXTENSIVE DEVELOPMENT SCENARIO

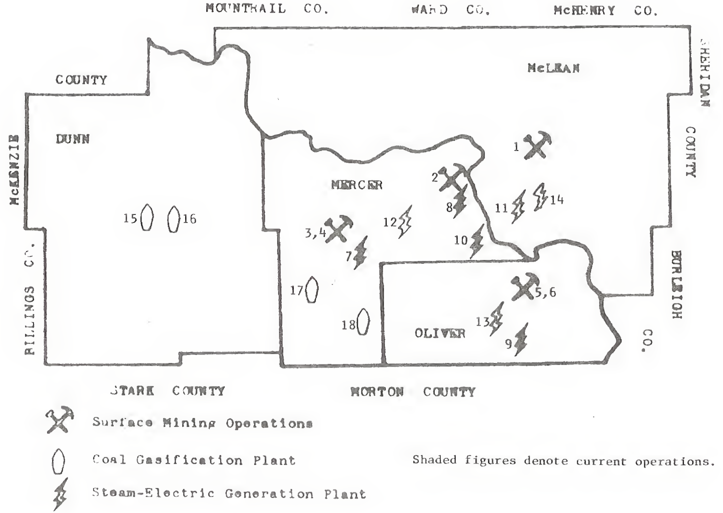
Map Ref. No.	County	Target Year	Operation or Plant	Production (tons) or Capacity (megawatts)[a]
1	McLean	Present	Mine	16,193
2	Mercer	Present	Mine	1,269,607
3	Mercer	Present	Mine	1,473,096
4	Mercer	Present	Mine	965,751
5	Oliver	Present	Mine	1,440,620
6	Oliver	Present	Mine	303
7	Mercer	Present	Steam-Electric	13.5
8	Mercer	Present	Steam-Electric	215.7
9	Oliver	Present	Steam-Electric	234.6
10	Mercer	Present	Steam-Electric	172.0
11[b]	McLean	1978-79	Steam-Electric	487.0
12	Mercer	1975	Steam-Electric	438.0
13	Oliver	1977	Steam-Electric	435.0
14[b]	McLean	1978-79	Steam-Electric	487.0
15	Dunn	1980	Gasification	250.0
16	Dunn	1980	Gasification	250.0
17	Mercer	1980	Gasification	250.0
18	Mercer	1980	Gasification	250.0
19	Mercer	1985	Gasification	250.0
20	McLean	1985	Gasification	250.0
21	Dunn	2000	Gasification	250.0
22	Dunn	2000	Gasification	250.0
23	Dunn	2000	Gasification	250.0
24	Dunn	2000	Gasification	250.0
25	Dunn	2000	Gasification	250.0
26	Mercer	2000	Gasification	250.0
27	Mercer	2000	Gasification	250.0
28	McLean	2000	Gasification	250.0
29	McLean	2000	Gasification	250.0
30	Oliver	2000	Steam-Electric	1,250.0
31	Mercer	2000	Steam-Electric	1,250.0
32	Oliver	2000	Export Mine Site	6,000,000.0

[a] In the case of a mine, production is in tons. For a steam-electric plant, capacity is stated in megawatts. For all gasification plants, capacity is assumed to be 250 million cubic feet per day.

[b] These two plants constitute approximately one 900 MW electric.

FIGURE 13. EXTENSIVE DEVELOPMENT SCENARIO

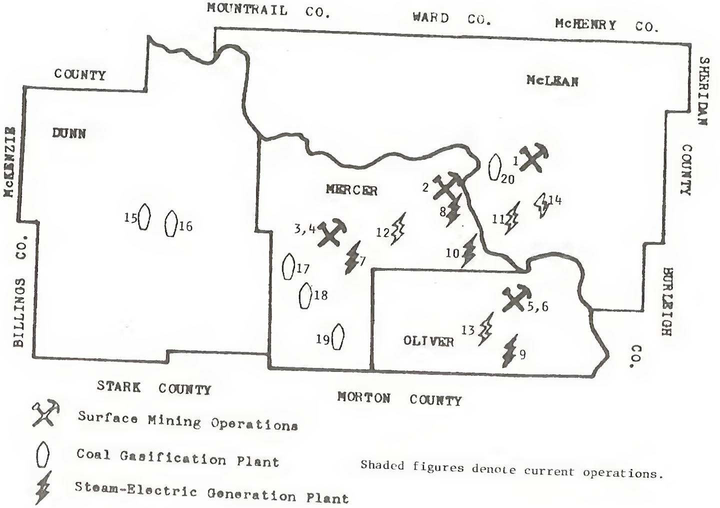
-1980-



Shaded figures denote current operations.

FIGURE 14. EXTENSIVE DEVELOPMENT SCENARIO

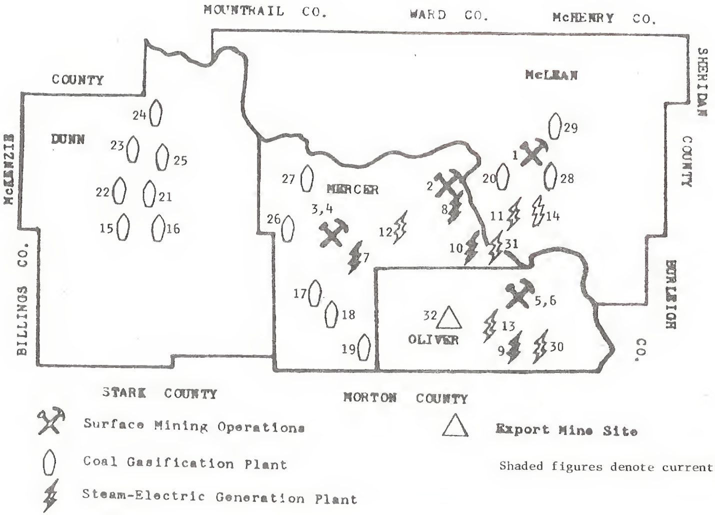
-1985-



Shaded figures denote current operations.

FIGURE 15. EXTENSIVE DEVELOPMENT SCENARIO

-2000-



Shaded figures denote current operations.

The Natural Gas Pipeline Company of America has announced intentions of building four gasification plants to be located near Dunn Center in Dunn County. The first plant is scheduled to be on line by 1982.

The El Paso Natural Gas Company has announced plans for four gasification plants to be located in North Dakota. El Paso owns extensive coal rights in Dunn County. Dunn County could quite probably be the location of two or three of these plants. The first of these plants is likely to be on line in 1982.

These announced plans for 10 to 12 coal gasification plants resemble the development pace of the Extensive Development Scenario.

Basin Electric Cooperative is currently expanding the capacity of its Leland Olds Plant near Stanton (Mercer County) by 438 MW. This plant expansion is scheduled for completion by 1975. Minnkota Power Company is expanding the capacity of its Milton R. Young Plant at Center (Mercer County) by 435 MW to be on line by 1977. They also have tentative plans for further development at the Center site. United Power Association and Cooperative Power Association are building a 900 MW plant near Falkirk (McLean County) to be on line in 1979. Montana - Dakota Utilities Company has announced plans for three units, each to generate 440 MW, located a few miles southwest of Beulah (Mercer County) with the first to be on line by 1981.

In addition to the announced plans for coal gasification and steam electric generation plants, the Bechtel, Westinghouse, and Union Carbide Corportations have announced plans for a uranium enrichment plant. North Dakota is being considered for the plant. The uranium enrichment plant would require 2,500 MW of electric power generating capacity. The study area is one location being considered for this plant.

SECTION III: PROFILE OF NORTH DAKOTA'S COAL MINE AND ELECTRIC POWER WORK FORCE

Introduction

This study was designed to provide a profile of North Dakota's existing coal mine and electric power plant work force. Knowledge of the existing coal industry labor force characteristics is an essential ingredient in planning for future development. The study was undertaken with the following objectives in mind:

1. To determine types of employment in North Dakota's coal mines and electric power plants.
2. To identify the socioeconomic characteristics of the existing coal industry work force.
3. To determine employee earnings from present jobs and the salary differential between previous employment and initial employment in the coal industry.
4. To define previous employment, employee tenure, and turnover patterns.

In this study, a 75.6 percent return was obtained from a survey of 246 employees, from three North Dakota coal mines, and two electric power generating plants. A survey questionnaire instrument (Appendix B) was developed in June and mailed to the Indian Head Mine employees (North American Coal Mine Corporation located in Mercer County) and the R. M. Heskett electric generating station employees (Montana Dakota Utilities, Morton County). The survey instrument was administered to the employees by a coal mine or power plant supervisor at the Basin Electric plant (located in Mercer County) and the Knife River Coal Company's two coal mines (located in Mercer County and Bowman County). Employees from Consolidation Coal Company, Minnkota Power Company and United

Power Cooperative (located in Oliver and Mercer counties) were also surveyed, but those surveys were not completed in time to be included in this report.[4]

The analysis of the coal industry work force in this report is descriptive in nature and contains the combined analysis of the employees of all five power plants and coal mines.

General Socioeconomic Characteristics

The 186 employees who completed the survey of the five electric power plants and coal mines were all Caucasian; over 94 percent were males and their average age was 37 years ranging from 18 to 67 years. Eighty-seven (87) percent of the employees were married, 12 percent had never been married, and 1 percent were either divorced or widowed. The employees had an average of 1.7 children living at home with a range of 0 to 10 children.

Over 87 percent of the employees were born in North Dakota, 10 percent were born in a state other than North Dakota, and nearly 2 percent of the employees were born in a foreign country. Table 8 indicates that 47.3 percent

TABLE 8. LOCATION OF COAL INDUSTRY EMPLOYEE RESIDENCES

Type of Residence	Number of Employees	Percent of Total Employees
Farm	25	13.4
Outside the City Limits, but Not a Farm	10	5.4
In a City Under 500 Population	36	19.4
In a City Between 500-1,000 Population	10	5.4
In a City Between 1,000-2,500 Population	88	47.3
In a City Between 2,500-5,000 Population	2	1.1
In a City Between 5,000-10,000 Population	0	0.0
In a City Over 10,000 Population	13	7.0
No Answer	2	1.1
Total	186	100.1

---

[4] A report on the North Dakota coal industry work force profile will be available in the fall of 1974, which will include Consolidation Coal Company, Minnkota Power Company, and United Power Cooperative.

of the employees lived in a city between 1,000 and 2,500 population, 19.4 percent lived in cities under 500 population, and 13.4 percent lived on farms. The farms on which 25 employees lived averaged 843 acres.

The employees have lived an average of 23 years in the community in which they now live, which indicates a high percentage of the existing coal industry work force is hired from the local labor force. Table 9 indicates the coal employee population is very stable, over 48 percent of the population have lived at their current address over 10 years. Over 70 percent of the employees owned their own house, while another 13.6 percent owned a trailer. Thirteen (13) percent of the employees rented a house or an apartment.

TABLE 9. YEARS AT PRESENT ADDRESS

Number of Years	Number of Employees	Percent of Total
Under 1 Year	25	13.4
1 to 3 Years	23	12.4
4 to 5 Years	16	8.6
5 to 10 Years	30	16.1
Over 10 Years	91	48.9
No Answer	1	.5
Total	186	99.9

Table 10 indicates where the employees lived before moving to their present community. Most of the employees that had lived in another community had moved to their present community from another North Dakota county.

TABLE 10. PREVIOUS LOCATION OF RESIDENCE

Residence	Number of Employees	Percent of Total
Never Haved Moved	76	40.9
Within County You Now Reside	27	14.5
From Another North Dakota County	56	30.1
Out of State	25	13.4
Foreign Country	1	.5
No Answer	1	.5
Total	186	99.9

Education

Table 11 indicates the formal education (excluding vocational training beyond high school) of the coal industry employees. Almost 25 percent of the employees had eight years or less of education, 40.3 percent had 12 years, while almost 25 percent had 13 or more years of education. Fifty-six employees indicated they had some vocational training. Table 12 illustrates the time in months spent at vocational training. Forty-nine employees indicated the type of vocational training they had (Table 13). Training in electronics, mechanics, and welding each accounted for 20.4 percent of the total of those employees that had vocational training.

TABLE 11. FORMAL EDUCATION OF EMPLOYEES[a]

Years of Education	Number of Employees	Percent of Total
8 Years or Less	46	24.7
9 to 11 Years	16	8.6
12 Years	75	40.3
13-15 Years	28	15.1
16 or More Years	18	9.7
No Answer	3	1.6
Total	186	100.0

[a] Excludes vocational training beyond high school.

TABLE 12. TIME SPENT IN VOCATIONAL TRAINING

Months of Training	Number of Employees	Percent of Total
6 Months or Less	11	5.9
7-12 Months	15	8.1
13-18 Months	8	4.3
19-24 Months	7	3.8
25 or More Months	10	5.4
Time Unknown	5	2.7
No Vocational Training	99	53.2
No Answer	31	16.7
Total	186	100.1

TABLE 13. TYPE OF VOCATIONAL TRAINING[a]

Type of Vocational Training	Number of Employees	Percent of Total
Electrical	10	20.4
Mechanic	10	20.4
Welding	10	20.4
Machinist	3	6.1
Secretary	2	4.1
Basic Engineering and Maintenance	4	8.2
Miscellaneous	10	20.4
Total	49	100.0

[a] Includes only those respondents indicating their type of vocational training.

Present Employment Characteristics

Job Title

The job titles of the employees' present jobs are indicated in Table 14. The 186 employees were categorized into 26 job classifications. Some difficulty was experienced in interpreting job classifications; but with the help of several coal industry representatives, the authors were able to derive the 26 job classifications. Heading the list of job categories are common laborers with 18.8 percent of the total employed. Dozer or caterpillar operators and truck drivers comprise 9.7 and 9.1 percent, respectively, of the total employed.

Sixty (60) percent of the present coal industry employees have held more than one position in the company in which they are currently employed. Almost 35 percent of the employees have held from two to three positions with the company by which they are currently employed and over 19 percent have held from four to six positions. This seems to indicate a considerable amount of

TABLE 14. PRESENT COAL INDUSTRY JOB TITLES

Job Title	Number of Employees	Percent of Total
1. Yard Operator or Car Spotter	8	4.30
2. Dragline Oiler	5	2.68
3. Auxiliary General Laborer	35	18.81
4. Senior or Dragline Operator	11	5.91
5. Mechanic	14	7.52
6. Electrician	6	3.22
7. Shift or General Foreman	13	6.98
8. Accountant	2	1.07
9. Engineer	6	3.22
10. Dozer Operator	18	9.67
11. Cleaning Lady	1	0.53
12. Preparation Man	1	0.53
13. Secretary	3	1.61
14. General or Overall Manager	3	1.61
15. Welder	4	2.15
16. Watchman	4	2.15
17. Boiler Attendant	5	2.68
18. Tipple Oiler	1	.53
19. Power Plant Operator	6	3.22
20. Operating Supervisor or Foreman	5	2.68
21. Office Supervisor	1	.53
22. Tipple Operator	5	2.68
23. Supply Clerk	5	2.68
24. Carpenter	2	1.07
25. Truck Driver	17	9.13
26. Shooter	2	1.07
27. No Answer	3	1.61
Total	186	99.84

promoting from within the company. The energy company employees have worked an average length of service with the company of 9.7 years. The employment tenure ranged from less than one year to 42 years. Almost 92 percent of the employees had not been unemployed during the past 12 months.

Yearly Earnings at Present Job

Table 15 shows the yearly earnings of North Dakota's coal industry workers by $1,000 income cohorts. Over 27 percent of the employees had

TABLE 15. YEARLY EARNINGS OF NORTH DAKOTA'S COAL INDUSTRY[a]

Income Cohort	Number of People	Percent of Total
Less than $5,000	9	5.1
$ 5,000-$ 5,999	5	2.8
6,000- 6,999	0	0.0
7,000- 7,999	1	.6
8,000- 8,999	3	1.7
9,000- 9,999	11	6.2
10,000- 10,999	22	12.4
11,000- 11,999	32	18.1
12,000- 12,999	48	27.1
13,000- 13,999	17	9.6
14,000- 14,999	13	7.3
15,000- 15,999	6	3.4
16,000- 16,999	4	2.3
18,000- 19,999	3	1.7
Over $20,000	3	1.7
Total	177	100.0

[a] Does not include nine nonrespondents.

yearly earnings from their present job between $12,000 and $13,000. (These figures are cash income and do not include fringe benefits.) Another 30.5 percent had incomes between $10,000 and $12,000. The median income was between $12,000 and $13,000. These incomes are well above the yearly earnings for North Dakota employees (see Appendix Tables 23 and 27).

Transportation

Seventy-eight (78) percent of the employees traveled by their own private car to work, 17.2 percent by car pool, and 4.8 percent by other means of transportation. The average distance traveled to work was 13.3 miles with a range from less than one mile to just over 100 miles.

Satisfaction With Present Job

The energy industry employees have indicated a high degree of satisfaction with their jobs. Employees were asked to rate their job satisfaction by choosing one of five possible responses: very satisfied, satisfied, indifferent, unsatisfied, and very unsatisfied. Over 33 percent of the employees were very satisfied with their work, 56.5 percent were satisfied, 9.1 percent were indifferent, 1.1 percent were unsatisfied, and no one was very unsatisfied with their job. Assigning a satisfaction rating of five points to very satisfied, four points for satisfied, three for indifferent, two for unsatisfied, and one for a very unsatisfied rating--the job satisfaction rating was 4.21 out of a possible five points.

Previous Employment Characteristics

Type of Previous Employer

One hundred fifty of the 186 coal industry employees had worked for another employer. Table 16 lists the type of employers by whom the present

TABLE 16. NAME OR TYPE OF PREVIOUS EMPLOYER[a]

Name or Type of Company	Number of Employees	Percent of Total
Gas Station	8	5.33
Engineering Company	4	2.67
Another Coal Company	8	5.33
Railroad Company	9	6.00
Oil and Petroleum Company	6	4.00
Truck Company	3	2.00
Mechanical Firm	5	3.33
Manufacturing Company	8	5.33
Clerical	2	1.33
Electric Firm	7	4.67
Construction Company	30	20.00
Car Dealer	3	2.00
School	5	3.33
Military	4	2.67
County, Federal, and State	6	4.00
Tri-City Cooperative	6	4.00
Self-Employed	15	10.00
Miscellaneous	19	12.67
No Answer	2	1.33
Total	150	99.99

[a] Does not include 36 employees who have never worked for a previous employer.

coal industry employees were previously employed. Construction companies were the previous employers of 20 percent of present energy company employees. Another 10 percent were self-employed before working in their present employment. Job titles of the previous employment of the present day coal company employees are indicated in Table 17. Common laborers accounted for almost 25 percent of the total, while equipment operators such as dozer or caterpillar operators accounted for an additional 14.7 percent of the previous jobs of the present employees. Over 35 percent of the employees' previous

TABLE 17. JOB TITLE OF PREVIOUS EMPLOYMENT[a]

Job Title	Number of Employees	Percent of Total
Gas Station Attendant	5	3.33
Equipment Operator	22	14.67
Machinist	3	2.00
Driller	2	1.33
Truck Driver	8	5.33
Accountant	3	2.00
Common Laborer	37	24.67
Mechanic	12	8.00
Secretary	3	2.00
Welder	3	2.00
Electrical	6	4.00
Construction	5	3.33
Janitor	3	2.00
Engineer	3	2.00
Salesman	4	2.67
General Management	5	3.33
Teacher	3	2.00
Farmer	7	4.67
Carpenter	2	1.33
Plumber	1	.67
Military	3	2.00
Partsman	2	1.33
Plant Superintendent	3	2.00
Miscellaneous	4	2.67
No Answer	1	.67
Total	150	100.00

[a] Does not include 36 employees who have never worked for a previous employer.

employment was in the county in which they now reside, 29 percent in another North Dakota county, almost 13 percent of the previous employment was out of state, and 3.2 percent was in some other location (e.g., in a foreign country). The present coal company employees worked an average of three years for their previous employer, and they traveled an average of 13.2 miles to work. Table 18 lists the reason the present coal company employees gave for leaving their previous employment. A higher salary and better working conditions were the reasons given by 50 percent of the present employees for leaving their previous employer.

TABLE 18. REASON FOR LEAVING PREVIOUS EMPLOYMENT[a]

Reason for Leaving	Number of Employees	Percent of Total
Better Working Conditions	33	22.00
More Money	42	28.00
Laid Off	25	16.67
Return Home to North Dakota	7	4.67
Advancement	18	12.00
Job Security	3	2.00
Military	4	2.67
Continue Education	5	3.33
Health	3	2.00
Miscellaneous	3	2.00
No Answer	7	4.67
Total	150	100.01

[a] Does not include 36 employees who have never worked for a previous employer.

Earnings at Last Job

Table 19 indicates the earnings of the present employees from their previous job at the time of leaving. The median income was between $6,000 and $7,000; this compares to the present median income of $12,000 to $13,000. The average salary differential between the ending salary of the previous employment and the starting salary of the present employment was $2,338. There were 112 employees receiving a net pay increase and eight with a net pay decrease.

TABLE 19. EARNINGS AT LAST JOB[a]

Earnings at Last Job	Number of Employees	Percent of Total
Less than $5,000	46	31.94
$ 5,000-$ 5,999	24	16.67
6,000- 6,999	20	13.88
7,000- 7,999	20	13.88
8,000- 8,999	11	7.63
9,000- 9,999	5	3.47
10,000- 10,999	10	6.94
11,000- 11,999	0	0.00
12,000- 12,999	4	2.77
13,000- 13,999	3	2.08
14,000- 14,999	0	0.00
15,000- 15,999	1	.69
Over $15,000	0	0.00
Total	144	99.95

[a] Does not include six nonrespondents or 36 employees who had never worked for a previous employer.

Job Classification Categories of Coal Mine Electric Power Plants, and Coal Gasification Plants

Tables 20 and 21 give another indication of the type of job classifications required for an electric power generating plant and a five million ton coal mine. The personnel requirements for a 250 (MMCFD) coal gasification plant proposed by El Paso Natural Gas Company called the "Burham Coal Gasification Complex" is indicated in Table 22.

TABLE 20. MANNING TABLE FOR A FIVE MILLION TON STRIP MINE IN NORTH DAKOTA

Personnel	Total	Percentage of Total Employment
Production:		
Dragline operator[a]	8	9.0
Dragline oiler[a]	8	9.0
Bulldozer operator[a]	8	9.0
Shovel operator (coal)	2	2.2
Shovel oiler (coal)	2	2.2
Truck driver (100-ton)	6	6.7
Coal driller	2	2.2
Coal shooter	2	2.2
Grader operator	2	2.2
Front-end loader operator	2	2.2
Serviceman	2	2.2
Sprinkler truck	2	2.2
Utility man	4	4.5
Bulldozer operator (reclamation)	1	1.1
Reclamation man	2	2.2
Subtotal	53	59.6
Maintenance:		
Mechanic	16	18.0
Electrician	4	4.5
Maintenance superintendent	1	1.1
Assistant maintenance superintendent	1	1.1
Subtotal	22	24.7
Supervision:		
Superintendent	1	1.1
Assistant superintendent	1	1.1
Mine foreman	3	3.4
Engineer	1	1.1
Assistant engineer	1	1.1
Timekeeper and clerk	4	4.5
Warehouseman	1	1.1
Purchasing agent	1	1.1
Reclamation foreman	1	1.1
Subtotal	14	15.7
GRAND TOTAL	89	100.0

[a] Workmen are employed in these positions 24 hours per day, 350 days per year.

SOURCE: Bureau of Mines, Cost Analyses of Model Mines for Strip Mining Coal in the United States, Bureau of Mines Information Circular 8535, U.S. Department of the Interior, Washington, D.C., 1972, p. 112.

TABLE 21. EXPECTED STAFFING PATTERNS FOR STEAM-ELECTRIC GENERATING PLANTS[a]

	Size Class of Employment			
	70-99		100-249	
Occupation	Expected Percentage of Employment	90% Confidence Level of Expected Employment	Expected Percentage of Employment	90% Confidence Level of Expected Employment
I. MAINTENANCE & PRODUCTION	86.1	86.1 ± 06.6	81.8	81.8 ± 11.2
A. Mechanics & Repairmen	28.6	28.6 ± 10.6	13.7	13.7 ± 16.0
1. Mechanic, Maintenance	25.0	25.0 ± 21.6	10.4	10.4 ± 16.5
2. All Other Mechanics & Repairmen	03.6		03.3	
B. All Other Maintenance	57.5	57.5 ± 15.5	68.0	68.0 ± 23.3
1. Foreman, Nonworking	11.4	11.4 ± 03.6	07.1	07.1 ± 06.6
2. Electrician (substation, etc.)	07.8	07.8 ± 04.6	06.7	06.7 ± 05.6
3. Instrument Repairman	03.9	03.9 ± 05.0	01.9	01.9 ± 03.8
4. Painter	01.2	01.2 ± 01.3	00.5	00.5 ± 00.8
5. Auxiliary Equipment Operator	10.8	10.8 ± 02.5	06.4	06.4 ± 08.9
6. Control Room Operator	05.4	05.4 ± 04.8	02.0	02.0 ± 04.0
7. Stationary Boiler Fireman	03.6	03.6 ± 11.6	05.2	05.2 ± 08.6
8. Turbine Operator	01.2	01.2 ± 03.8	05.6	05.6 ± 05.1
9. Switchboard Operator	01.2	01.2 ± 03.8	03.4	03.4 ± 04.8
10. Helper, Trades	01.8	01.8 ± 05.4	12.9	12.9 ± 20.0
11. Etc.	09.2		16.3	
II. SERVICE OCCUPATIONS	02.7	02.7 ± 01.2	03.3	03.3 ± 04.6
A. Janitors, Porters & Cleaners	02.7	02.7 ± 01.2	01.9	01.9 ± 03.0
B. All Other Service Occupations	00.0		01.4	
III. MANAGERS & OFFICERS	03.0	03.0 ± 02.1	03.5	03.5 ± 03.6
A. Managers, Engineering	02.1	02.1 ± 02.0	01.3	01.3 ± 01.2
B. All Other Managers & Officers	00.9		02.2	

- continued -

TABLE 21. EXPECTED STAFFING PATTERNS FOR STEAM-ELECTRIC GENERATING PLANTS[a] (CONTINUED)

	Size Class of Employment			
	70–99		100–249	
Occupation	Expected Percentage of Employment	90% Confidence Level of Expected Employment	Expected Percentage of Employment	90% Confidence Level of Expected Employment
IV. PROFESSIONAL & TECHNICAL OCCUPATIONS	02.7	02.7 ± 03.1	07.2	07.2 ± 05.9
A. Engineers	01.5	01.5 ± 01.5	02.9	02.9 ± 03.0
1. Mechanical Engineers	00.9	00.9 ± 01.5	01.7	01.7 ± 01.5
2. Electrical & Electronic Engineers	00.6	00.6 ± 01.0	00.9	00.9 ± 01.5
3. All Other Engineers	00.0		00.3	
B. Engineering Technicians	00.3	00.3 ± 01.0	02.1	02.1 ± 02.0
C. Physical Scientists	00.0	00.0 ± 00.0	02.0	02.0 ± 03.3
D. All Other Professional & Technical Occupations	00.9	00.9 ± 02.5	01.3	01.3 ± 02.5
1. Science Technician	00.9	00.9 ± 02.5	01.3	01.3 ± 02.5
2. Etc.	00.0		00.7	
V. CLERICAL OCCUPATIONS	05.4	05.4 ± 02.5	04.3	04.3 ± 04.6
A. Stenographer	00.9	00.9 ± 00.8	00.8	00.8 ± 01.8
B. Stock Clerk	02.7	02.7 ± 02.1	01.5	01.5 ± 02.1
C. All Other Clerical Occupations	01.8		02.0	

[a] Table represents a limited sample of eight steam electric generating plants in a 21-state area. Four plants are included in each size class of employment.

SOURCE: United States Departmen of Labor, Bureau of Labor Statistics, Occupational Employment Survey, Kansas City, Missouri.

TABLE 22. PERSONNEL REQUIREMENTS FOR A 250 MMSCFD COAL GASIFICATION PLANT

Personnel	Number Required	Percentage of Total Employment
A. Supervisory and Staff Position		
Complex Superintendent	1	.1
Secretary	1	.1
Manager Operation	1	.1
Operations Engineer	3	.4
Clerk	1	.1
Secretary	1	.1
Area Engineer	10	1.4
Area Foreman	30	4.2
Manager Technical	1	.1
Technical Supervisor	1	.1
Technical Service Engineer	5	.7
Specialist Engineer	5	.7
Clerk	1	.1
Secretary	1	.1
Chief Chemist	1	.1
Chemists	4	.6
Draftsmen	3	.4
Lab Technician	14	1.9
Maintenance Supervisor	1	.1
Clerk	2	.3
Secretary	1	.1
Maintenance Engineer	5	.7
Metal Inspector	3	.4
Shop Foreman	1	.1
Maintenance Foreman	8	1.1
Administrative Supervisor	1	.1
Personnel Representative	1	.1
Asst. Personnel Rep.	1	.1
Personnel Clerks	2	.3
Training Supervisor	1	.1
Office Services Rep.	1	.1
Telephone Operators	2	.3
Janitors	2	.3
Receptionist-Typist	1	.1

- continued -

TABLE 22. PERSONNEL REQUIREMENTS FOR A 250 MMSCFD COAL GASIFICATION PLANT (CONTINUED)

Personnel	Number Required	Percentage of Total Employment
A. Supervisory and Staff Position (continued)		
Chief Accountant	1	.1
Payroll Clerk	2	.3
Yield & Shipping Clerks	3	.4
Data Processing	2	.3
Material Warehouseman	1	.1
Purchasing Clerk	2	.3
Warehouse Workers	4	.6
Secretary	1	.1
Security Supervisor	1	.1
Safety Foreman	4	.6
Nurse	1	.1
Security Guards	6	.8
	145	20.1
B. Process Operators (per shift)		
Operator	19	2.6
Assistant Operator	28	3.9
Helper Operator	11	1.5
Pool Operator	5	.7
Total Per Shift	63	8.7
Total Process Operators	296	41.1
C. Maintenance Mechanics		
Lead Plant Repairman	8	1.1
Plant Mechanic	81	11.2
Helper Mechanic	66	9.2
Welder	19	2.6
Machinist	16	2.2
Painter	3	.4
Electrician	11	1.5

- continued -

TABLE 22. PERSONNEL REQUIREMENTS FOR A 250 MMSCFD COAL GASIFICATION PLANT (CONTINUED)

Personnel	Number Required	Percentage of Total Employment
C. Maintenance Mechanics (continued)		
Communication Tech.	3	.4
Corrosion Tech.	3	.4
Instrument Tech.	9	1.2
Pool Laborers	61	8.5
Total Requirements	280	38.8
D. Total Personnel Requirements and Direct Salary Costs		
Supervisory and Staff	145	20.1
Process Operators	296	41.1
Maintenance Mechanics	280	38.8
Grand Total -	721	100.0

SOURCE: Stearns-Roger Company, Burham Coal Gasification Complex, El Paso Natural Gas Company, Job No. C-10450, Denver, Colorado, 1973.

SECTION IV: MERCER COUNTY LABOR SURVEY

Introduction

The survey of the heads of households in Mercer County was undertaken principally to determine the availability, skills, and attitude of the local labor force towards employment either directly related to coal development or indirectly as a result of coal development. A survey questionnaire (Appendix C) was developed and mailed in July to a random sample of 25 percent of the heads of households with Mercer County addresses. The sample was selected from phone listings encompassing Mercer County. This section of the report contains an analysis based on a 20 percent return or 101 household heads from the total sample of 504 households. A second mailing has been made to the nonrespondent heads of households, but was not returned in time to be included in this report.[5] The general objectives of the study are:

1. To develop a profile of the heads of households in Mercer County.
2. To identify the socioeconomic characteristics of all family members of the Mercer County households.
3. To define the supply of local labor in Mercer County and compare it to the established demand for labor in more urbanized counties. This may help reflect the future demand for labor in Mercer County.
4. To determine the interest, skills, and availability of all family members towards employment directly related to coal development.
5. To determine the interest, skills, and availability of all family members towards employment created indirectly as a result of the coal development.

---

[5] A final report of all respondents from two mailings and a personal interview follow up of the nonrespondents will be available in the fall of 1974.

6. To determine the Mercer County residents preference of city size and ranking of community services.

General Socioeconomic Characteristics of Heads of Households

Eighty-five (85) percent of the 101 Mercer County heads of households were born in North Dakota, 10 percent were born out of state, and approximately 4 percent were born in a foreign country. The household heads have lived an average of 35.7 years in their community. Thirty-seven (37) percent of the household heads have always lived in their present communities, 12 percent moved to their present community from within the county in which they now reside, 35 percent moved to their present community from one of 17 North Dakota counties, and 15 percent moved to their community from one of nine other states. The heads of households in Mercer County comprise a very stable population. Sixty-one (61) percent of the household heads have lived 10 years or more at their present address, an additional 16 percent have lived five to 10 years at their present address, and only 7 percent of the household heads had lived at their present address less than one year.

Twenty (20) percent of household heads reside on a farm, 8 percent outside the city limits; but not on a farm, 10 percent live in a town with less than 500 people, 2 percent live in cities between 500 and 1,000, 58 percent live in a city above 1,000 population, and 3 percent did not answer the question. Seventy-four (74) percent of the household heads own their own house, 8 percent own a trailer, and 6 percent own their residence, but did not indicate the type of residence. Nine (9) percent of households rent their residence and 3 percent did not answer the question. There was an average of 2.94 people living in the Mercer County households and an average of .7 members of each household (69 members) were under 16 years of age.

Yearly Earnings of the Household Heads

The yearly earnings of the household heads are shown in Table 23. Over 45 percent of the household heads earned between $10,000 and $15,000. The level of earnings was influenced by the unusually high farm incomes in 1973 as 20 percent of the household head respondents were farmers. However, almost 16 percent of the Mercer County household heads earned less than $6,000 at their present job. The household heads have worked an average of 21 years at their present job and 8 percent of the household heads have been unemployed at sometime during the past 12 months.

TABLE 23. YEARLY EARNINGS OF THE HOUSEHOLD HEAD

Earnings at Present Job	Number of Households	Percent of Total[a]
Less than $5,000	9	10.98
$ 5,000-$ 5,999	4	4.88
6,000- 6,999	5	6.10
7,000- 7,999	5	6.10
8,000- 8,999	7	8.53
9,000- 9,999	4	4.88
10,000- 11,999	21	25.61
12,000- 14,999	17	20.73
15,000- 19,999	5	6.10
Over $20,000	5	6.10
Total	82	100.01

[a] Percentages do not include 19 nonrespondents.

Satisfaction With Present Employment

Twenty-five of the household heads indicated they were very satisfied with their present employment 45 were satisfied, 15 were indifferent, 2 were unsatisfied, no one indicated that they were very unsatisfied, and 15 households did not answer the question. Assigning a rating of "five" for very satisfied, "four" for satisfied, "three" for indifferent, "two" for unsatisfied, and "one" for very unsatisfied and disregarding the 15 nonrespondents; the 87 household heads; job satisfaction rating was 4.07 out of a possible five points.

Characteristics of the Household Members Over 16 Years of Age

Household Head

Age and Sex

There were 92 male and nine female household heads. Their average age was 51.7 years.

Education and Skills

The household heads averaged 11.3 years of formal education. Fifteen household heads had received vocational training and the average length of this training was 13.3 months. The type of vocational training of the household heads is indicated in Table 24. Mechanical and electrical training were the most common vocational training. Special job skills indicated by the respondents are indicated in Table 25. Thirty-five household heads

TABLE 24. TYPE OF VOCATIONAL TRAINING OF HOUSEHOLD HEAD

Type of Vocational Training	Number of Household Heads	Percent of Total[a]
Sheet Metal and Welding	2	13.33
Bookkeeping	1	6.66
Electrical	5	33.33
Mechanical	4	26.66
Law Enforcement	1	6.66
Beautician	1	6.66
X-Ray	1	6.66
Total	15	99.96

[a] Percentage based on end number of 15 household heads.

TABLE 25. SPECIAL JOB SKILLS OF HOUSEHOLD HEADS

Type of Job Skill	Number of Household Heads	Percent of Total[a]
Accounting	3	8.57
Selling	3	8.57
Mechanical	11	31.43
Animal Science	1	2.86
Carpenter	1	2.86
Pilot	1	2.86
Abstractor	1	2.86
Electrician	1	2.86
Nurse	1	2.86
Law Enforcement	1	2.86
Welding	2	5.71
Transportation	2	5.71
Beautician	1	2.86
Teacher	3	8.57
Operative, Nontransport	3	8.57
Total	35	100.01

[a] Percentage based on end number of 35 household heads.

indicated special job skills with mechanical skills accounting for the most responses (11 of 35).

Occupational Title of Household Head

Ninety-six household heads indicated their occupational title (Table 26). Farmers, professional, and retired household heads accounted for 51 percent of the sample.

Spouse of Household Head

Age

There were 88 spouses of the household heads in the sample and their ages averaged 46.2 years.

Education and Skills

The spouses of the heads of households averaged 11.5 years of formal education. Nine spouses had received an average of 13.3 months of vocational training.

TABLE 26. OCCUPATION TITLE OF HOUSEHOLD HEAD

Occupation Title	Number of Household Heads	Percent of Total[a]
Professional, Technical, and Kindred Workers	15	15.63
Managers and Administrators, Except Farm	8	8.33
Sales Workers	2	2.08
Clerical and Kindred Workers	3	3.13
Craftsmen	11	11.46
Operatives	4	4.17
Transportation	5	5.21
Farmers	20	20.83
Farm Laborer	1	1.04
Service	9	9.38
Housewife	4	4.17
Retired	14	14.58
Total	96	100.01

[a] Percentage does not include five household heads not indicating an occupation.

Five spouses had vocational training in secretarial work and four had training in nursing. Special job skills of the spouses are shown in Table 27. Clerical skills accounted for 10 of 23 special job skills listed by the spouses.

TABLE 27. SPECIAL JOB SKILLS OF SPOUSE

Type of Skill	Number of Spouses	Percent of Total[a]
Accounting	5	21.73
Clerical	10	43.48
Artist	1	4.35
Nurse	2	8.70
Beautician	1	4.35
Teacher	3	13.04
Real Estate	1	4.35
Total	23	100.00

[a] Percentage based on end number of 23 spouses.

Occupation of Spouse

The occupational title of the spouses is listed in Table 28. Seventy-five (75) percent of the spouses listed their occupational title as housewife. The clerical and professional categories accounted for 18.5 percent of the occupations of the spouses.

TABLE 28. OCCUPATIONAL TITLE OF SPOUSE

Occupation Title	Number of Spouses	Percent of Total[a]
Professional	6	7.41
Managers and Administrators	1	1.23
Sales Workers	1	1.23
Clerical	9	11.11
Farmers	1	1.23
Service	2	2.47
Housewife	61	75.31
Total	81	99.99

[a] Percentage based on end number of 81 spouses.

All Other Family Members Over 16 Years of Age

The study of the family members was separated into the household head, spouse, oldest son, youngest son, oldest daughter, youngest daughter, and other family members.

Age and Sex

There were 18 oldest sons and five youngest sons 16 years of age and older living at home. The ages ranged from 17 to 33 years. There were 11 daughters in the households ranging in age from 18 to 28 years. There were five other family members, two males and three females, with an average age of 51.4 years.

Education and Skills

Average years of education for all other family members were 11.8 years for the oldest son, 13.2 years for the youngest son, 13.6 years for the oldest daughter, and 11.7 years for the other family members. Table 29 lists the special job skills of all other family members. Only nine other family members indicated their special skills; of those two were clerical and two were in law enforcement. Vocational training of all other family members is shown in Table 30. Thirteen other family members were listed as having vocational training. Three members had vocational training in sheet metal and welding and two in mechanics.

TABLE 29. SPECIAL JOB SKILLS OF ALL OTHER HOUSEHOLD MEMBERS

Type of Special Job Skill	Oldest Son	Youngest Son	Oldest Daughter	Youngest Daughter	Other	Total	Percent of Total[a]
Bookkeeping and Accounting	0	0	0	0	0	0	0.
Selling	1	0	0	0	0	1	11.
Clerical	0	0	1	0	1	2	22.
Agricultural and Animal Science	0	0	0	0	0	0	0.
Artist	0	0	0	0	0	0	0.
Carpentry	1	0	0	0	0	1	11.
Mechanic	1	0	0	0	0	1	11.
Pilot Training	0	0	0	0	0	0	0.
Abstractor	0	0	0	0	0	0	0.
Electrician	0	0	0	0	0	0	0.
Nurse and Technicians	0	0	0	0	0	0	0.
Law Enforcement	0	0	2	0	0	2	22.
Welding	0	0	0	0	0	0	0.
Transportatives, Truck Drivers, etc.	0	0	0	0	0	0	0.
Beautician	0	0	0	0	1	1	11.
Teaching	0	0	1	0	0	1	11.
Operative, Nontransport	0	0	0	0	0	0	0.
Real Estate	0	0	0	0	0	0	0.
Other	0	0	0	0	0	0	0.
Total	3	0	4	0	2	9	99.

[a] Percentage based on nine all other family members reporting special job skills.

TABLE 30. TYPE OF VOCATIONAL TRAINING OF ALL OTHER HOUSEHOLD MEMBERS

Type of Vocational Training	Oldest Son	Youngest Son	Oldest Daughter	Youngest Daughter	Other	Total	Percent of Total[a]
Sheet Metal, Welding	3	0	0	0	0	3	23.1
Bookkeeping	0	1	0	0	0	1	7.7
Electric	0	1	0	0	0	1	7.7
Mechanical	1	1	0	0	0	2	15.4
Nurse	0	0	0	0	0	0	0.0
Heavy Equipment	1	0	0	0	0	1	7.7
Secretary	0	0	0	0	1	1	7.7
Law Enforcement	0	0	1	0	0	1	7.7
Beautician	0	0	0	0	1	1	7.7
Key Punch Operator	0	0	1	0	0	1	7.7
X-Ray Technician	0	0	0	0	0	0	0.0
Vocational Agriculture	1	0	0	0	0	1	7.7
Other	0	0	0	0	0	0	0.0
Total	6	3	2	0	2	13	100.1

[a] Percentage based on 13 all other family members reporting vocational training.

Occupational Title of All Other Family Members

Table 31 lists the occupational titles of all other family members. Over half of all other family members were students, 16.6 percent were service workers and craftsmen.

Occupational Title of All Family Members

The combined occupational titles for the 211 family members that indicated their job title is shown in Table 32. Housewives, students, and retired people are included in the percentages. Professionals and farmers are the most common occupational pursuits in the sample.

Family Member's Interest in Coal Related Employment

Table 33 indicates that a total of 28 family members were interested in coal related employment, 109 members were not interested, and 17 did not know.

TABLE 31. OCCUPATIONAL TITLE OF ALL OTHER HOUSEHOLD MEMBERS

Occupation Title	Oldest Son	Youngest Son	Oldest Daughter	Youngest Daughter	Other	Total	Percent of Total[a]
Professional, Tech., and Kindred Workers	1	1	0	0	0	2	5.9
Managers and Administrators, Except Farm	0	0	0	0	0	0	0.0
Sales Workers	0	0	0	0	0	0	0.0
Clerical and Kindred Workers	1	0	0	0	0	1	2.9
Craftsmen, Foremen, and Kindred Workers	1	1	0	0	1	3	8.8
Operatives, Except Transport	0	0	0	0	0	0	0.0
Transport Equipment Operatives	0	0	0	0	0	0	0.0
Laborers Except Farm	1	0	0	0	0	1	2.9
Farmers and Farm Managers	2	1	0	0	0	3	8.8
Farm Laborers and Farm Foremen	0	0	0	0	0	0	0.0
Service Workers, Except Private Households	1	0	1	0	1	3	8.8
Private Household	0	0	0	0	0	0	0.0
Housewife	0	0	0	0	1	1	2.9
Student	8	2	8	0	0	18	52.9
Military	0	0	0	0	0	0	0.0
Retired	0	0	0	0	2	2	5.9
Other	0	0	0	0	0	0	0.0
Total	15	5	9	0	5	34	99.8

[a] Percentage based on 34 all other family members.

TABLE 32. OCCUPATIONAL TITLE OF ALL HOUSEHOLD MEMBERS

Occupation Title	Number of All Household Members	Percent of Total[a]
Professional, Technical, and Kindred Workers	23	10.9
Managers and Administrators, Except Farm	9	4.3
Sales Workers	3	1.4
Clerical and Kindred Workers	13	6.2
Craftsmen, Foremen, and Kindred Workers	14	6.6
Operatives, Except Transport	4	1.9
Transport Equipment Operatives	5	2.4
Laborers, Except Farm	1	.5
Farmers and Farm Managers	24	11.4
Farm Laborers and Farm Foremen	1	.5
Service Workers, Except Private Households	14	6.6
Private Households	0	0.0
Housewife	66	31.3
Student	18	8.5
Military	0	0.0
Retired	16	7.6
Other	0	0.0
Total	211	100.1

[a] Percentage based on the 211 family members indicating an occupation.

TABLE 33. FAMILY MEMBERS INTEREST IN COAL INDUSTRY EMPLOYMENT

	Interest in Employment			
Family Member	Yes	No	Do Not Know	Total[a]
Household Head	13	57	11	81
Spouse	2	44	3	49
All Other Members	13	8	3	24
Total	28	109	17	154

[a] Does not include 69 family members under 16 or 74 members that did not answer the question.

The type of coal related job the family members indicated an interest in is indicated in Table 34. Twenty-four family members indicated a type of job preference for coal related employment. One indication of the underemployment that may exist in a community is the number of people who would not have to terminate employment in their present job in securing another job. Table 35

TABLE 34. TYPE OF COAL RELATED JOB FAMILY MEMBERS INDICATED AN INTEREST

Job Type	Family Members Household Head	Spouse	All Other Family Members	Total[a]
Welding	1		2	3
Electrical	1		2	3
Management	3			3
Mechanic	3		1	4
Law Enforcement	1		1	2
General Labor	1			1
Machine Operator	1			1
Clerical		1	2	3
Anything Available			4	4
Total	11	1	12	24

[a] Based on end number of 24 family members that indicated a job-type preference, there were four nonrespondents.

TABLE 35. AVAILABILITY OF FAMILY MEMBERS INTERESTED IN COAL INDUSTRY EMPLOYMENT[a]

Family Members	Would Have to Quit Present Job	Would Not Have to Quit Present Job
Household Head	8	2
Spouse	1	1
All Other Family Members	4	3
Total	13	6

[a] Based on end number of 19, there were nine nonrespondents.

indicates that six family members would not have to terminate their present employment if they were to secure coal related employment.

Family Member's Interest in Employment Created Indirectly as a Result of Coal Development

Table 36 indicates that 26 family members expressed an interest in employment indirectly related to coal development, 87 members were not interested and 25 were not sure. The type of job in which the family members were interested is shown in Table 37. Clerical positions were indicated most frequently. The

TABLE 36. FAMILY MEMBER'S INTEREST IN EMPLOYMENT CREATED INDIRECTLY AS A RESULT OF COAL DEVELOPMENT

Family Member	Interest in Employment			Total[a]
	Yes	No	Do Not Know	
Household Head	11	47	8	66
Spouse	7	33	5	45
All Other Members	8	7	12	27
Total	26	87	25	138

[a]Does not include 69 family members under 16 and 90 family members not answering the question.

TABLE 37. TYPE OF INDIRECT COAL RELATED JOB FAMILY MEMBERS INDICATED AN INTEREST

Job Type	Household Head	Spouse	All Other Family Members	Total[a]
Clerical	1	3	2	6
Range Management	1			1
Electrical	2			2
Management	2			2
Public Relations	1			1
Mechanic	1			1
Teacher	1	1		2
Other	1	1	1	3
Cook		1		1
Welding			1	1
Iron Worker			1	1
Anything Available			1	1
Law Enforcement			1	1
Total	10	6	7	23

[a]Based on end number of 23 family members that indicated a job preference, there were three nonrespondents.

availability of the family members in pursuing employment indirectly induced by coal development is shown in Table 38. Six family members stated they would not have to quit their present employment, which may reflect some degree of underemployment, and 10 family members interested in such employment would have to terminate their present employment.

TABLE 38. AVAILABILITY OF FAMILY MEMBERS INTERESTED IN EMPLOYMENT INDIRECTLY RELATED TO COAL DEVELOPMENT[a]

Family Members	Would Have to Quit Present Job	Would Not Have to Quit Present Job
Household Head	7	2
Spouse	2	3
All Other Family Members	1	1
Total	10	6

[a] Based on end number of 16, there were 10 nonrespondents.

Demand and Supply of Labor

Demand for Labor

The present day labor force in Mercer, Dunn, McLean, and Oliver counties is shown in Table 39. These four counties are based largely on agriculture. Over 41 percent of the occupations in 1970 were farmers or farm laborers. The 1970 labor force in four more urbanized counties of North Dakota (Burleigh, Cass, Ward, and Stark) is also shown in Table 39. Just over 8 percent of the occupations of employed persons over 16 in these more urbanized counties involved farm managers and farm laborers.

A more detailed tabulation of the 1970 occupational categories in Table 39 and the 1960 occupational categories shown in Table 40 may provide some insight into what the demand for labor in the four rural counties may be in the future if extensive coal development results in a substantial population increase. It appears that as the counties increase in population and occupational complexity the occupational categories of service, managers, sales workers, professional and clerical increase substantially, and agriculture occupations, in particular, decline. The agricultural employment decline is in relative terms; that is, agricultural workers decline as a percent of the total, but not necessarily in absolute numbers. The transport operatives,

TABLE 39. EMPLOYED PERSONS 16+ BY MAJOR OCCUPATIONAL CATEGORY AND SEX FOR TOTAL OF BURLEIGH, CASS, WARD, STARK AND TOTAL OF MERCER, DUNN, OLIVER, MCLEAN COUNTIES, NORTH DAKOTA, 1970

	Occupation Code	Burleigh, Cass, Ward, Stark				Mercer, Dunn, Oliver, McLean			
		Male	Female	Total	% of Total	Male	Female	Total	% of Total
Professional, Technical, and Kindred Workers	01	6,185	4,793	10,978	16.03	405	416	821	10.11
Managers and Administrators, Except Farm	02	6,304	1,122	7,426	10.84	415	136	551	6.78
Sales Workers	03	3,671	2,151	5,822	8.50	124	153	277	3.41
Clerical and Kindred Workers	04	2,856	9,175	12,031	17.57	162	465	627	7.72
Craftsmen, Foremen, and Kindred Workers	05	7,157	322	7,479	10.92	786	17	803	9.89
Operatives, Except Transport	06	2,457	944	3,401	4.96	191	20	211	2.60
Transport Equipment Operatives	07	2,344	81	2,425	3.54	194	---	194	2.39
Laborers, Except Farm	08	2,022	158	2,180	3.18	250	10	260	3.20
Farmers and Farm Managers	09	3,708	158	3,866	5.64	2,736	162	2,898	35.71
Farm Laborers and Farm Foremen	10	1,167	106	1,273	1.85	442	43	485	5.97
Service Workers, Except Private Households	11	3,702	6,771	10,473	15.29	333	540	873	10.75
Private Household Workers	12	27	1,081	1,108	1.61	4	111	115	1.41
Total Employed, 16 Years Old and Over		41,600	26,862	68,462	99.93	6,042	2,073	8,115	99.94

SOURCE: Characteristics of the Population, 1970 Census of Population, U.S. Department of Commerce, Bureau of the Census, North Dakota.

TABLE 40. EMPLOYED PERSONS 14+ BY MAJOR OCCUPATIONAL CATEGORY AND SEX FOR TOTAL OF BURLEIGH, CASS, WARD, STARK AND TOTAL OF MERCER, DUNN, OLIVER, MCLEAN COUNTIES, NORTH DAKOTA, 1960

		Burleigh, Cass, Ward, Stark				Mercer, Dunn, Oliver, McLean			
	Occupation Code	Male	Female	Total	% of Total	Male	Female	Total	% of Total
Professional, Technical, and Kindred Workers	01	4,055	3,269	7,324	12.24	394	405	799	8.35
Managers and Administrators, Except Farm	02	5,767	1,032	6,799	11.36	476	81	557	5.82
Sales Workers	03	3,164	1,665	4,829	8.07	185	162	347	3.63
Clerical and Kindred Workers	04	2,791	6,603	9,394	15.69	182	291	473	4.98
Craftsmen, Foremen, and Kindred Workers	05	6,299	202	6,501	10.86	624	12	636	6.65
Operatives, Except Transport	06	4,509	919	5,428	9.07	412	47	459	4.80
Transport Equipment Operatives	07								
Laborers, Except Farm and Mine	08	2,027	51	2,078	3.47	154	3	157	1.64
Farmers and Farm Managers	09	5,589	293	5,882	9.83	3,696	94	3,790	39.62
Farm Laborers and Farm Foremen	10	1,740	241	1,981	3.31	914	438	1,352	14.13
Service Workers, Except Private Households	11	2,295	4,248	6,543	10.93	211	404	615	6.43
Private Household Workers	12	48	1,774	1,822	3.04	7	171	178	1.86
Occupations Not Reported		690	589	1,279	2.14	135	67	202	2.11
Total Employed, 14 Years Old and Over		38,974	20,886	59,860	100.01	7,390	2,175	9,565	100.02

SOURCE: Characteristics of the Population, 1960 Census of Population, U.S. Department of Commerce, Bureau of the Census, North Dakota.

nontransport operatives, and craftsmen will certainly increase substantially in the wake of coal development, perhaps much more than is indicated in Table 39. Many of those jobs are directly related to coal development and demand for these jobs are easier to project than demand for employment created indirectly as a result of coal development. Perhaps Tables 39 and 40 are a better indication of the demand for employment indirectly created by coal development.

Supply of Labor

One indication of the supply of local labor is the labor participation rate. Table 41 reveals the 1970 labor participation rate by sex, for Mercer, McLean, Dunn, and Oliver counties. Mercer County's male participation rate was 80 percent in 1970, while the female participation rate was 25.6 percent. The four-county labor participation rate averaged 75.9 percent for males and 26.9 percent for females. Assuming that the male participation rate could be increased to 90 percent participation and the female participation rate could be increased to 50 percent in the advent of substantial coal development; a total of 3,415 more employees (1,469 males and 1,946 females) could enter the labor force (Table 41). It appears that a large number of females could enter the labor force. A substantial percentage of the clerical and sales positions that would be created with expanded coal activity could be filled by local females.

The Mercer County labor survey provides another indication of the supply, skills, and availability of the local labor force. The educational and farm backgrounds of the local labor force seem well suited for the mechanical dexterity desired in coal related employment. In addition, many people that are native to western North Dakota may look upon coal development as an opportunity to come home and seek employment in their native state.

TABLE 41. POPULATION, EMPLOYMENT, AND ESTIMATE OF POTENTIAL AND AVAILABLE LABOR FORCE IN DUNN, MCLEAN, MERCER, AND OLIVER COUNTIES, 1970

	Total Population 16 Years and Over	Number in Labor Force[a]	Work Partici- pation	Total Employed	Potential Labor Force[b]	Difference Between Potential Labor Force and Total Employed
Males:						
Dunn	1,667	1,359	81.5	1,335	1,500	165
McLean	3,822	2,687	70.4	2,501	3,440	939
Mercer	2,078	1,662	80.0	1,600	1,870	270
Oliver	779	620	79.6	606	701	95
4-County Total	8,346	6,328	75.9[c]	6,042	7,511	1,469
Females:						
Dunn	1,463	378	25.8	355	732	377
McLean	3,716	1,058	28.5	1,013	1,858	845
Mercer	2,149	550	25.6	532	1,075	543
Oliver	707	173	24.5	173	354	181
4-County Total	8,035	2,159	26.9[c]	2,073	4,019	1,946
Both Sexes:						
Dunn	3,130	1,737	55.5	1,690	2,232	542
McLean	7,538	3,745	49.7	3,514	5,298	1,784
Mercer	4,227	2,212	52.3	2,132	2,945	813
Oliver	1,486	793	53.4	779	1,055	276
4-County Total	16,381	8,487	51.8[c]	8,115	11,530	3,415

[a] Includes only civilians, employed and unemployed.

[b] Assuming a 90 percent work participation rate for males and a 50 percent work participation rate for females.

[c] Averages are weighted for the 4-county total.

Source: Ostenson, T. K., North Dakota Employment Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series Issue No. 7, Agricultural Experiment Station, North Dakota State University, Fargo, April, 1972.

Household Heads Preference to City Size

Ninety-five household heads indicated a preference for the city size in which they would most prefer to live (Table 42). Cities between 1,000-2,500 were preferred by 47 percent of the household heads, 19 percent preferred to live on a farm, while only 8.4 percent preferred cities over 5,000 population.

TABLE 42. HOUSEHOLD HEADS PREFERENCE OF CITY SIZE[a]

City Size	Number of Family Members	Percent of Total
Farm	18	19.0
Less than 500 Population	8	8.4
500-1,000 Population	7	7.4
1,000-2,500 Population	45	47.4
2,500-5,000 Population	9	9.5
5,000-10,000 Population	5	5.3
10,000-25,000 Population	1	1.1
25,000-50,000 Population	2	2.1
50,000-100,000 Population	0	0.0
Over 100,000 Population	0	0.0
Total	95	100.2

[a] Does not include six nonrespondent households.

Household Heads Preference for Community Services

Household heads were asked to rank 15 community services as being either essential, desirable, or not essential for the city where they would most prefer to live. Table 43 indicates the type of community service and the number of household heads indicating their preference for each service. For example, 90 household heads indicated their preference for hospital services, of these 41 indicated a preference of "Essential" (they would prefer not to live in a city without this service), one person's preference was "highly desirable," 45 indicated a preference of "desirable" (would prefer to have this service within an hour's drive of where they live), only three household heads believed

TABLE 43. HOUSEHOLD HEAD PREFERENCE FOR COMMUNITY SERVICES

	ESSENTIAL		DESIRABLE		NOT ESSENTIAL		
Type of Service	Would not Prefer to Live in Town Without This Service	Highly Desirable	Would Prefer to Have Service Within a Short Drive of Where I Live (less than one hour drive)	Somewhat Desirable	As Long as Service is Within a Half Day Drive from Where I Live	Total Households	Pref. Rating
Hospital	41	1	45		3	90	3.86
Resident Doctor (but not hosp.)	58	1	23		1	83	4.39
High School	69	1	11		1	82	4.67
Grade School	70	1	10		1	82	4.69
Cafe	72	1	12			85	4.63
Small Grocery Store	64	3	11		1	79	4.63
Shopping Center	31	2	41		9	83	3.55
Dentist	43	3	34	1	1	82	4.05
Human Services (psychiatrist, social services, etc.)	13	3	34		24	74	2.74
Barber	62	1	22		1	86	4.43
Bank	69	1	17		1	88	4.55
Drugstore	63	1	22			86	4.48
Golf Course	24		28	1	22	75	3.04
Municipal Airport	14		30		32	76	2.52
Automobile Dealer	45	1	32	1	8	87	3.85
Womens or Mens Specialty Clothes	42	2	26	1	13	84	3.70
Total	780	22	398	4	118	118	4.02

hospital services were "not essential" (service need only be within a half day drive from where they live).

Table 43 also indicates a preference rating for the community services. Assigning a "five" to an essential ranking, a "four" to a highly desirable ranking, a "three" to a desirable ranking, a rating of "two" to somewhat desirable, and a "one" to a not essential rating--the combined preference rating for all community services was 4.02 (highly desirable) or in between essential and desirable. The preference ratings varied from 4.69 for grade schools to 2.52 for a municipal airport.

It is interesting to note that a substantial percentage of the households prefer to live in a city under 2,500 population, but also desire most of the 15 community services listed in Table 43.

SECTION V: ANTICIPATED CHANGES IN STATE AND LOCAL COSTS AND REVENUES

Introduction

Anticipated changes in public costs and revenues associated with operation of one 250 MMCFD coal gasification plant (and accompanying 10 million ton per year[6] mine) and one 1,250 MW electric generating plant complex (and accompanying 7.5 million ton per year mine) are discussed in this section of the report. The public cost and revenue changes (in 1972 prices) associated with operation of a gasifiction plant and an electric generating plant are analyzed identically, but independent of each other.

Economic Impacts of Operation of a Coal Gasification Plant and Electric Generating Plant and Associated Mines

Several types of economic impacts result from the construction and operation of a facility, such as a coal gasification or electric generating plant. Some of the impacts are annually recurring as a consequence of the continuing expenditures in the local community for such items as wages, salaries, and locally purchased materials. Other impacts are "one-time" and nonrecurring. Such impacts result from plant construction and from construction of any new residences, business structures, or public facilities, such as schools, streets, and water systems that will be required to accommodate the new plant.

This section is an analysis of the annually recurring economic impacts of plant (and mine) operation. No estimates are made in this report of the employment and population impacts of plant construction because some estimates of plant costs and construction scheduling are still tentative.

---

[6] Recent estimates from Natural Gas Pipeline Company of America indicate a 12.9 ton per year mine may be needed to fuel a 250 MMCFD gasification plant. However, no change in cost or employment is assumed in this study.

Assumptions Concerning Operational Employment of a Gasification Plant and Electric Generating Plant and Associated Mines

The gasification plants estimated operational employment is 625 full-time employees. The gasification plant employment estimates are based on the assumption that the Lurgi Process is utilized. The labor requirement required for the associated 10.0 million ton per year mine is 300 full-time employees.

The electric power generating plant estimated operational employment is 125 full-time employees. The labor requirements associated with the accompanying 7.5 million ton per year mine is 135 full-time employees.

Gross Business Volume Projections

For purposes of projecting the economic impacts, the local expenditures were estimated and assigned to the sectors from which inputs are purchased. Interdependence coefficients were applied to these expenditures to obtain estimates of the gross business volume generated in the respective economic sectors.

The relevant interdependence coefficients are presented in Table 44. Each coefficient indicates the gross business volume (receipts) of the row

TABLE 44. INTERDEPENDENCE COEFFICIENTS FOR EXPENDITURES TO SECTORS 4 (CONSTRUCTION), 8 (RETAIL TRADE), AND 12 (HOUSEHOLDS)

Sector in Which Gross Business Volume is Generated		Sector to Which Expenditure is Made		
		4. Construction	8. Retail Trade	12. Households
8.	Retail Trade	.4098	1.2733	.7442
12.	Households	.6086	.4032	1.5516
4-11.	All Businesses	1.7036	1.5214	1.3165

sector that is generated per dollar of expenditure to the column sector. For example, each dollar of expenditure to the retail trade sector (Sector 8) will generate a total gross business volume of $1.27 in all retail trade firms in the area, $.40 of personal income (Sector 12), and $1.52 in gross business volume to all business firms (Sector 4-11) in the area. (For sector identification, refer to Table 45.)

TABLE 45. PROJECTED GROSS BUSINESS VOLUME OF ECONOMIC SECTORS RESULTING FROM EXPENDITURES FOR GASIFICATION PLANT AND MINE OPERATION (BASED ON 1972 PRICES)

Sector No.	Sector	Million Dollars
1	Agriculture, Livestock	1.58
2	Agriculture, Crops	.57
3	Mining	.09
4	Construction	1.32
5	Transportation	.19
6	Communications and Utilities	1.66
7	Wholesale and Ag. Production	.87
8	Retail	19.02
9	Fire, Insurance, and Real Estate	2.44
10	Business and Personal Services	.87
11	Professional and Social Services	1.37
12	Households	21.45
13	Government	1.58

Local expenditures for plant operation are introduced into the local economy via the retail trade and household sectors. Local expenditures to the retail trade sector are for such items as supplies, maintenance materials, fuel, and lubricants. Expenditures to the household sector consist principally of wages, salaries, and royalty payments.

The procedures used to estimate the effects of energy development on gross business volume in the respective economic sectors involved application of interdependence coefficients (of the sectors from which inputs were purchased) to the dollar volume of those expenditures. The effects of gross business volumes (of the respective sectors) resulting from expenditures for a gasification plant and mine operation are summarized in Table 45.

The effects of gross business volume (of the respective sectors) resulting from expenditures for electric generating plant and mine operation are summarized in Table 46.

TABLE 46. PROJECTED GROSS BUSINESS VOLUME OF ECONOMIC SECTORS RESULTING FROM EXPENDITURES FOR ELECTRIC GENERATING PLANT AND MINE OPERATION (BASED ON 1972 PRICES)

Sector No.	Sector	Million Dollars
1	Agriculture, Livestock	.73
2	Agriculture, Crops	.27
3	Mining	.03
4	Construction	.53
5	Transportation	.09
6	Communications and Utilities	.69
7	Wholesale and Ag. Production	.41
8	Retail	9.61
9	Fire, Insurance, and Real Estate	.97
10	Business and Personal Services	.34
11	Professional and Social Services	.53
12	Households	8.23
13	Government	.63

Total Operational Employment

Table 47 indicates the total (direct and indirect) employment resulting from operation of a gasification and an electric generating plant and associated mines. There are 2,466 people employed directly and indirectly in the coal gasification plant and associated mine. Total direct and indirect employment in an electric generating plant and associated mine is 936 people.

Changes in Public Costs and Revenues

The changes in public costs for additional schools, streets, water and sewage facilities, and other public investments, as well as the changes in

TABLE 47. PROJECTED TOTAL (DIRECT AND INDIRECT) EMPLOYMENT RESULTING FROM GASIFICATION AND ELECTRIC GENERATING PLANT AND MINE OPERATION

Sector No.	Sector	Total Gasification Plant Employment	Total Electric Generating Plant Employment
1	Agriculture, Livestock	68	33
2	Agriculture, Crops	26	12
3	Mining	1	2
4	Construction	69	28
5	Transportation	35	17
6	Communications & Utilities	82	34
7	Wholesale & Ag. Production	35	16
8	Retail	452	228
9	Fire, Insurance, & Real Estate	62	25
10	Business & Personal Services	62	24
11	Professional & Social Services	183	71
13	Government	466	186
	Total Indirect	1,541	676
	Direct Operation Employment	925[a]	260[b]
	Total--Direct and Indirect	2,466	936

[a] Direct employment includes 625 coal gasification plants' estimated employment and 300 estimated to be employed by the mine for a total of 925 persons.

[b] Direct employment includes 125 electric generating plants' estimated employment and 135 estimated to be employed by the mine for a total of 260 persons.

state and local tax revenues, depend on the magnitude of coal resource development, the settlement patterns of the work force, and the type of housing in which the population resides. Although many combinations of these variables could be formulated, together with cost and revenue estimates for each, it was decided to consider only two such combinations. These combinations generally correspond to the sets of assumptions resulting in the extremes of probable changes in public costs and revenues associated with coal resource development in Mercer County.

Although the actual changes associated with development likely will be somewhere between these two extremes, it was concluded that initial analysis should be addressed to estimating the upper and lower bounds of possible impacts. The sets of assumptions employed in this analysis were:

Situation I

1. The ratio of population to employment is 2.71.
2. The average family size is 3.25.
3. The operation of an electric generating plant and associated mine will result in 936 workers (direct and indirect) immigrating from outside Mercer County and settling in a Mercer County city whose former population was 1,500 people. This will result in 2,537 new residents and 781 new families in the central city $\left(\frac{936 \text{ workers} \times 2.71}{3.25} = 781 \text{ families}\right)$.
4. The operation of the gasification plant and associated mine will result in 2,466 workers (direct and indirect) immigrating from outside Mercer County and settling in a Mercer County city whose former population was 1,500 people. This will result in 6,683 new residents and 2,056 new families in the central city $\left(\frac{2{,}466 \text{ workers} \times 2.71}{3.25} = 2{,}056 \text{ families}\right)$.

Situation II

1. The ratio of population to employment is 2.71.
2. The average family size is 3.25.
3. There are 813 people living in Mercer County area who are not now fully employed and who would work in the gasification plant or electric power plant and commute from their present residences (Table 41).
4. Of the additional employees that will be required in either the gasification plant or electric generating plant 25 percent will reside in Mercer County and the rest will commute from residences in nearby counties. The immigrating population is distributed among cities in relation to the cities present population of 1,500; 1,200; 500; 300; and 200.

5. An estimated 813 people will be hired from the local labor force to work in employment directly or indirectly associated with an electric generating plant (assuming these workers had not already been employed in a coal gasification plant). The remaining 123 workers (936-813) will reside outside Mercer County. Under situation II for an electric generating plant no new families would reside in Mercer County.
6. An estimated 813 people will be hired from the local labor market to work in employment directly or indirectly associated with a coal gasification plant and one-fourth 413 (1,653 ÷ 4) of the additional workers will move to Mercer County, but be distributed throughout the county (assuming these 813 workers had not already been employed in an electric generating plant). The remaining workers will reside outside of Mercer County. This will result in 1,119 new residents and 344 new families in the county ($\frac{413 \text{ workers} \times 2.71}{3.25}$ = 344 families).

Three alternative types of housing for new residents were considered:

1. Single-family houses,[7] valued at $27,751 each, or
2. Apartments,[8] valued at $12,290 per unit, or
3. Trailer homes,[9] valued at $7,125 each.

Changes in State Tax Revenues

State tax revenues that will be affected by coal resource development include revenues from sales and use taxes, personal income taxes, and corporate income taxes. Changes in these revenues will be of two types--annually recurring (associated with plant operation) and nonrecurring (associated with plant construction; construction of new residences; construction of business structures to accommodate expanded business volume in the area; and construction of public facilities, such as schools, streets, and water and sewage systems).

---

[7] 1972 average valuation obtained from Fargo-Moorhead Home Builders' Association.

[8] *Ibid.*

[9] 1974 price of a two-bedroom trailer (14' X 60') adjusted to 1972 price level.

The basis for estimating each type of tax involved applying the 4 percent sales and use tax rate to estimated taxable sales, applying an average personal income tax rate to estimated personal incomes, and applying a corporate income tax estimator to estimated gross business volumes of Sectors 4 through 11 (the business sectors in the economy). (See Table 45 for sector identification.) The average personal income tax rate used was 1.5 percent. This was arrived at by dividing the total personal income tax collections in 1973 ($43,692,703) by estimated total personal income for that year ($2,954,133,102). The corporate income tax estimator was the average ratio of corporate income tax collections to estimated gross business volume of Sectors 4 through 11 for the years 1963-1973. This ratio was 0.00113.

Annually Recurring State Tax Revenues

The changes in annual state tax revenues associated with operation of a coal gasification plant and an electric generating plant involved application of input-output interdependence coefficients to annual local expenditures for the respective plant operations. The results of this computation yielded estimates of the gross business volumes of the retail trade sector, the household sector (whose gross business volume is equivalent to personal income), and all nonagricultural business sectors (Sectors 4 through 11).

The relevant interdependence coefficients are presented in Table 44. Each coefficient indicates the gross business volume (receipts) of the row sector that is generated per dollar of expenditure to the column sector.

For example, each dollar of expenditure to the retail trade sector (Sector 8) will generate a total gross business volume of $1.27 in all retail trade firms in the area, $.40 of personal income (Sector 12), and $1.52 in gross business volume to all business firms (Sectors 4-11) in the area.

Annually Recurring State Tax From Gasification Plant and Associated Mine

It has been estimated that operation of a coal gasification plant (and associated mine) will require annual inputs from local firms in the retail trade sector (Sector 8) of $8,084,000 and will have an annual payroll of $11,724,000 (Table 48). (These expenditures are based on 1972 prices.)

TABLE 48. ANNUAL EXPENDITURES FOR GASIFICATION PLANT OPERATION AND ESTIMATED ANNUAL GROSS BUSINESS VOLUME OF SELECTED SECTORS RESULTING FROM THOSE EXPENDITURES, GASIFICATION PLANT AND ASSOCIATED MINE AND PIPELINE (1,000 DOLLARS, 1972 PRICES)

	Sector to Which Expenditure is Made		
	8. Retail Trade	12. Households	Total
Expenditure	$ 8,084	$11,724	$19,808
Sector in Which Gross Business Volume is Generated	Gross Business Volume		
8. Retail Trade	$10,293	$ 8,725	$19,018
12. Households	3,259	18,191	21,450
4-11. All Businesses	12,299	15,435	27,734

Application of interdependence coefficients to these expenditures yields estimates of the gross revenues of the retail trade sector, the household sector, and the total of all business sectors. For example, expenditures of $8,084,000 to the retail trade sector generate, directly and indirectly, a total gross business volume of $10,293,000 to all firms in the retail trade sector (1.2733 x $8,084,000 = $10,293,000); $3,259,000 of personal income (.4032 x $8,084,000 = $3,259,000); and $12,299,000 to all business firms in the area (1.5214 x $8,084,000 = $12,299,000). Similar interpretations hold for expenditures to the household sector; i.e., .7442 x $11,724,000 = $8,725,000 gross business volume in the retail trade sector.

Computation of estimated annual sales and use tax revenues were made by applying the 4 percent sales and use tax rate to the gross business volume of the retail trade sector (Table 49). Similar computations were made for personal income tax revenues and corporate income tax revenues by applying the tax estimates estimators to the gross business volumes of the respective sectors. Total annual state tax revenues generated by plant operation are estimated to be $1.11 million, consisting of $.76 million sales and use tax, $.32 million personal income tax, and $.03 million corporate income tax.[10]

TABLE 49. GROSS BUSINESS VOLUMES, TAX ESTIMATORS, AND ESTIMATED ANNUAL TAX REVENUES, BY SECTOR AND TYPE OF TAX, GASIFICATION PLANT AND RELATED MINE AND PIPELINE

Sector		Type of Tax	Gross Business Volume	Tax Estimator	Tax Revenue
8.	Retail Trade	Sales and Use	$19,018,000	.04	$ 760,720
12.	Households	Personal Income	21,450,000	.015	321,750
4-11.	All Businesses	Corporate Income	27,734,000	.00113	31,339
Total					$1,113,809

Annually Recurring State Tax From Electric Generating Plant and Associated Mine

Estimate of inputs purchased locally for operation of an electric generating plant will amount to $5,239,000 in the retail trade sector and will have an annual payroll of $3,945,000 (Table 50). (These expenditures are based on 1972 prices.) Application of interdependence coefficients to these expenditures

---

[10] Does not include any corporate income taxes paid by the coal gasification plant.

TABLE 50. ANNUAL EXPENDITURES FOR ELECTRIC GENERATING PLANT OPERATION AND ESTIMATED ANNUAL GROSS BUSINESS VOLUME OF SELECTED SECTORS RESULTING FROM THOSE EXPENDITURES, ELECTRIC GENERATING PLANT, AND ASSOCIATED MINE (1,000 DOLLARS, 1972 PRICES)

	Sector to Which Expenditure is Made		
	8. Retail Dunn	12. Households	Total
Expenditure	$5,239	$3,945	$ 9,184
Sector in Which Gross Business Volume is Generated	Gross Business Volume		
8. Retail Trade	$6,671	$2,936	$ 9,607
12. Households	2,112	6,121	8,233
4-11. All Businesses	7,971	5,194	13,165

yields estimates of gross revenues to the retail trade sector, the household sector, and the total of all business sectors. For example, expenditures of $5,239,000 to the retail trade sector generate, directly and indirectly, a total gross business volume of $6,671,000 to the retail trade sector, $2,112,000 of personal income to the household sector and $7,971,000 to the business firms in the area.

Applying the same tax estimators for the electric generating plant as were applied for the gasification plant results in a total state tax revenues of $522,651; consisting of $384,280 sales and use tax, $123,495 personal income tax, and $14,876 corporate income tax (Table 51).[11]

Annual tax revenues associated with one 250 (MMCFD) gasification plant and accompanying mine are approximately twice as large as one 1,250 MW electric generating plant and accompanying mine. There is little difference between Situation I (where all the new employees are new residents in Mercer County) and Situation II with respect to state tax revenues. Most of whatever

---

[11] Does not include any corporate income taxes paid by the electric generating plant.

TABLE 51. GROSS BUSINESS VOLUMES, TAX ESTIMATORS, AND ESTIMATED ANNUAL TAX REVENUES, BY SECTOR AND TYPE OF TAX, ELECTRIC GENERATING PLANT AND RELATED MINE

Sector		Type of Tax	Gross Business Volume	Tax Estimator	Tax Revenue
8.	Retail Trade	Sales and Use	$ 9,607,000	.04	$384,280
12.	Households	Personal Income	8,233,000	.015	123,495
4-11.	All Businesses	Corporate Income	13,165,000	.00113	14,876
Total					$522,651

difference would exist is due to the reduced needs for construction of residences, business structures, and public facilities in Situation II, which are discussed in the following subsections.

Nonrecurring State Tax Revenues

Nonrecurring tax revenues are "one-time" tax collections resulting from temporary economic activity associated with construction of a gasification plant (and related mine and pipeline) or an electric generating plant (and associated mine), and any new business structures, residences, and public facilities that may be required indirectly because of the increased economic activity in the area. Although these impacts may be spread over more than one year, the important point is that the impact is only a given amount--whether all in one year, half in each of two years, or one-third in each of three years.

Plant Construction

The procedure used to estimate the impacts of plant construction is identical to that employed for plant operation. Analysis of plant construction impact will be possible when detailed information on construction costs and time scheduling of construction activities are available.

Business Structure Construction Associated With Operation of A Coal Gasification Plant

The impacts of construction of business structures to meet the needs of expanded business activity associated with increased population in the area depends in large measure on the magnitude of the population increase in the area and on the commuting patterns that emerge. If all the additional employment consists of new residents to the area and if they all reside in Mercer County (Situation I assumptions), virtually all the required capacity for conducting business volume of the private sectors will involve construction of new business structures. On the other hand, if a significant amount of the additional employment is of present residents of the area and if many of the other employees commute from their residences in nearby cities, such as Bismarck or Dickinson (Situation II assumptions), the need for additional business structures will be significantly reduced. This is true because some excess capacity now exists in the private sectors and business volumes could be further increased by hiring more people and lengthening the business hours in existing facilities.

The estimates of the dollar value of required new business structures and the estimated changes in state tax revenues associated with their construction and associated tax revenues for the assumptions of Situation II will range downward from the upper limit estimated for Situation I.

Analyses conducted by the Department of Agricultural Economics, North Dakota State University, have indicated that investment in business structures is about 22 cents per dollar of gross business volume.[12] It has been estimated that the increased business activity resulting from operation of a gasification plant (and associated mine and pipeline) will be about $27.7 million annually (Table 48). The estimated investment in new business structures to support this increased business volume is $6.101 million (.22 x $27.734 million = $6.101 million).

---

[12] Prestgard, P. G., Effect of Coal Development on Public Costs and Revenues in North Dakota, unpublished M.S. thesis, Department of Agricultural Economics, North Dakota State University, Fargo, North Dakota, September, 1974.

Expenditures of $6.1 million to the construction sector for building new business structures are estimated to generate increased gross business volumes of $2.5 million in the retail trade sector, $3.7 million for the household sector, and $10.4 million for all business sectors (Table 52).

TABLE 52. INTERDEPENDENCE COEFFICIENTS FOR SELECTED SECTORS AND GROSS BUSINESS VOLUMES GENERATED IN THOSE SECTORS BY $6.101 MILLION EXPENDITURES TO THE CONSTRUCTION SECTOR

Sector in Which Gross Business Volume is Generated		Interdependence Coefficient	Gross Business Volume Generated ($1,000)
8.	Retail Trade	.4098	2.500
12.	Households	.6086	3.713
4-11.	All Businesses	1.7036	10.394

The estimated state tax revenues generated by the construction of $6.1 million of new business structures is $167,440 (Table 53). This consists of $100,000 of sales and use tax revenues; $55,695 of personal income taxes; and $11,745 of corporate income taxes.

TABLE 53. GROSS BUSINESS VOLUMES, TAX ESTIMATORS, AND ESTIMATED TAX REVENUES, BY SECTOR AND TYPE OF TAX FROM CONSTRUCTION OF $6.101 MILLION OF NEW BUSINESS STRUCTURES

Sector		Type of Tax	Gross Business Volume	Tax Estimator	Tax Revenue
8.	Retail Trade	Sales and Use	$ 2,500,000	.04	$100,000
12.	Households	Personal Income	3,713,000	.015	55,695
4-11.	All Businesses	Corporate Income	10,394,000	.00113	11,745
Total					$167,440

Business Structure Construction Associated With Operation of an Electric Generating Plant

The estimates of the dollar value of required new business structure and the estimated changes in state tax revenues associated with operation of an electric generating plant are for the assumptions of Situation I. The magnitude of new construction and associated tax revenues for the assumptions of Situation II will range downward from the upper limit estimated for Situation I. Investment in business structures is about 22 cents per dollar of gross business volume.[13] Table 50 indicates that about $13.2 million dollars of gross business volume is associated annually with operation of an electric generating plant and associated mine. The estimated investment in new business structures to support this increased business volume is 2.896 million (.22 x 13,165 million = 2.896 million).

Expenditures of 2.896 million to the construction sector for building new business structures are estimated to generate gross business volumes of $1.187 million in the retail sector, $1.763 million in the household sector, and $4.934 million for all business sectors (Table 54). Table 55 illustrates the

TABLE 54. INTERDEPENDENCE COEFFICIENTS FOR SELECTED SECTORS OF GROSS BUSINESS VOLUMES GENERATED IN THOSE SECTORS BY 2.896 MILLION EXPENDITURES TO THE CONSTRUCTION SECTOR

Sector in Which Gross Business Volume is Generated		Interdependence Coefficient	Gross Business Volume Generated ($1,000)
8.	Retail Trade	.4098	1.187
12.	Households	.6086	1.763
4-11.	All Businesses	1.7036	4.934

---

[13] *Ibid.*

TABLE 55. GROSS BUSINESS VOLUMES, TAX ESTIMATORS, AND ESTIMATED TAX REVENUES BY SECTOR AND TYPE OF TAX FROM CONSTRUCTION OF 2.896 MILLION OF NEW BUSINESS STRUCTURES

Sector		Type of Tax	Gross Business Volume	Tax Estimator	Tax Revenue
8.	Retail Trade	Sales and Use	$1,187,000	.04	$47,480
12.	Households	Personal Income	1,763,000	.015	26,445
4-11.	All Businesses	Corporate Income	4,934,000	.00113	5,575
Total					$79,500

expected state tax revenues generated by the construction of 2.896 million of new business structures is $79,500. This consists of $47,480 of sales and use tax; $26,445 personal income tax; and $5,575 of corporate income taxes.

Residential Construction Associated With a Coal Gasification and Electric Generating Plant and Associated Mines

Needs for new residences were estimated for alternative combinations of housing and settlement patterns. In order to span the widest possible feasible range of likely outcomes , the two extreme settlement patterns described on page 74 were used. Total expenditures associated with a coal gasification plant and mine for construction of houses or apartments or for purchase of trailers to accomodate the new families range from 2.5 million for Situation II and trailers to $57.1 million for Situation I and single-family houses (Table 56). Total expenditures associated with an electric generating plant range from 21.7 million for single-family houses to 5.6 million for Situation I to no expenditures associated with Situation II.

The interdependence coefficients for the construction sector (Table 44) were applied to estimated expenditures for construction of houses and apartments (Table 56) to obtain estimates of the gross business volume generated

TABLE 56. ESTIMATED EXPENDITURES FOR CONSTRUCTION OF HOUSES OR APARTMENTS OR PURCHASE OF TRAILERS FOR A COAL GASIFICATION PLANT AND ELECTRIC GENERATING PLANT

Type of Housing	Unit Cost[a]	Situation I Coal Gasification (2,056 New Families)	Situation II Coal Gasification (344 New Families)	Situation I Electric Generating (781 New Families)	Situation II Electric Generating (No New Families)
Houses	$27,751	$57,056,056	$9,546,344	$21,673,531	None
Apartments	12,290	25,268,240	4,227,760	9,598,490	None
Trailers	7,125	14,649,000	2,451,000	5,564,625	None

[a] 1972 prices.

in selected sectors by those expenditures (Table 57). The resulting gross business volumes ranged from $1.7 million (in the retail trade sector from construction of apartments, Situation II) to 97.2 million (in all business sectors from construction of houses, Situation I) (Table 57) associated with a coal gasification plant.

Interdependence coefficients for the retail trade sector (Table 44) were applied to estimated expenditures for purchase of trailers (Table 56) to obtain estimates of the gross business volume generated in selected sectors by those expenditures (Table 58). The resulting gross business volumes ranged from $1.0 million (of household income, Situation II) to $22.3 million (in all business sectors, Situation I) for coal gasification, and from 8.5 million (all business sectors) to 2.2 million (household income) Situation I to no impact Situation II for an electric generating plant.

Sales and use tax revenues for each of the combinations were estimated by applying the 4 percent tax rate to the gross business volumes of the retail trade sectors. Similar procedures were used for personal income tax and corporate income tax revenues by applying the 1.5 percent tax rate to personal incomes and the .113 percent rate to the gross business volumes of all business sectors. Estimates of total state tax revenues ranged from $115 thousand for Situation II and apartment residences to $1.6 million for Situation I and single-family houses for coal gasification (Table 59). Estimates of total state tax revenues vary from none under Situation II to .6 million for Situation I and single-family houses for electric generating plants (Table 60).

Public Facility Construction Associated With a Coal Gasification Plant and Associated Mines

Capacity requirements of public facilities were estimated for the alternative settlement patterns. (These procedures are described in the section on

TABLE 57. ESTIMATED EXPENDITURES FOR CONSTRUCTION AND ESTIMATED GROSS BUSINESS VOLUME OF SELECTED SECTORS RESULTING FROM THOSE EXPENDITURES, BY SETTLEMENT SITUATION, AND BY TYPE OF HOUSING (MILLION DOLLARS, 1972 PRICES)

		Situation I Coal Gasification		Situation II Coal Gasification		Situation I Electric Generating		Situation II Electric Generating	
		Houses	Apartments	Houses	Apartments	Houses	Apartments	Houses	Apartments
Expenditure		$57.056	$25.268	$ 9.566	$4.228	$21.674	$ 9.959	---	---
Sector in Which Gross Business Volume is Generated		Gross Business Volume							
8.	Retail Trade	23.381	10.355	3.920	1.733	8.882	4.081	---	---
12.	Households	34.724	15.378	5.822	2.573	13.191	6.061	---	---
4-11.	All Businesses	97.201	43.047	16.297	7.203	36.924	16.966	---	---

TABLE 58. ESTIMATED EXPENDITURES FOR PURCHASE OF TRAILERS AND ESTIMATED GROSS BUSINESS VOLUME OF SELECTED SECTORS RESULTING FROM EXPENDITURES, BY SETTLEMENT (MILLION DOLLARS, 1972 PRICES)

	Situation I Coal Gasification	Situation II Coal Gasification	Situation I Electric Generating	Situation II Electric Generating
Expenditure	14.649	2.451	5.565	None
Sector in Which Gross Business Volume is Generated	Gross Business Volume			
8. Retail Trade	18.127	3.121	7.086	---
12. Households	5.906	.988	2.244	---
4-11. All Businesses	22.287	3.729	8.467	---

TABLE 59. TAX ESTIMATORS, ESTIMATED GROSS BUSINESS VOLUMES, AND ESTIMATED "ONE-TIME" STATE TAX REVENUES, BY SECTOR AND TYPE OF TAX, RESULTING FROM CONSTRUCTION OF HOUSES OR APARTMENTS OR FROM SALE OF TRAILERS, BY SETTLEMENT SITUATION AND BY TYPE OF HOUSING FOR A COAL GASIFICATION PLANT

				Gross Business Volume ($1,000,000)						Tax Revenue ($1,000)					
				Situation I			Situation II			Situation I			Situation II		
	Sector	Type of Tax	Tax Estimator	Houses	Apart-ments	Trailers	Houses	Apart-ments	Trailers	Houses	Apart-ments	Trailers	Houses	Apart-ments	Trailers
8.	Retail Trade	Sales and Use	.04	23.4	10.4	18.1	3.9	1.7	3.1	936	416	724	156	68	124
12.	Households	Personal Income	.015	34.7	15.4	5.9	5.8	2.6	1.0	521	231	89	87	39	15
4-11.	All Businesses	Corporate Income	.00113	97.2	43.0	22.3	16.3	7.2	3.7	110	49	25	18	8	4
Total State Tax Revenues										1,567	696	838	261	115	143

TABLE 60. TAX ESTIMATORS, ESTIMATED GROSS BUSINESS VOLUMES, AND ESTIMATED "ONE-TIME" STATE TAX REVENUES, BY SECTOR AND TYPE OF TAX, RESULTING FROM CONSTRUCTION OF HOUSES OR APARTMENTS OR FROM SALE OF TRAILERS, BY SETTLEMENT SITUATION AND BY TYPE OF HOUSING FOR AN ELECTRIC GENERATING PLANT

				Gross Business Volume ($1,000,000)						Tax Revenue ($1,000)					
				Situation I			Situation II			Situation I			Situation II		
	Sector	Type of Tax	Tax Estimator	Houses	Apart-ments	Trailers	Houses	Apart-ments	Trailers	Houses	Apart-ments	Trailers	Houses	Apart-ments	Trailers
8.	Retail Trade	Sales and Use	.04	8.9	4.1	7.1	0	0	0	356	164	284	0	0	0
12.	Households	Personal Income	.015	13.2	6.1	2.2	0	0	0	198	92	33	0	0	0
4-11.	All Businesses	Corporate Income	.00113	36.9	17.0	8.4	0	0	0	42	19	09	0	0	0
Total State Tax Revenues										596	275	326	0	0	0

changes in public costs.) Total investments were estimated to be $13.6 million for Situation I and $1.5 million for Situation II for a coal gasification plant. Total investments for Situation I electric generating plant were estimated to be 6.0 million (Table 61).

Tax revenues generated by the increased economic activity associated with the construction of these facilities were estimated in the same manner as for previous local impacts. Interdependence coefficients for the construction sector were applied to the expenditures for construction of public facilities (Table 61) to obtain estimates of the gross business volume generated in the respective sectors of the local economy (Table 62). For example, the $13.6 million of expenditures for construction of public facilities in Situation I (coal gasification plant) would be expected to generate gross business volumes of $5.6 million in the retail trade sector and $23.3 million in all business sectors and a personal income of $8.3 million.

"One time" state tax revenues resulting from the construction impacts were estimated by applying tax rates (or estimators) for sales and use tax, personal income tax, and corporate income tax to the estimated gross business volumes (Table 63). Estimated total state tax revenues were $40.9 thousand for Situation II (coal gasification), $375.3 thousand for the assumptions of Situation I (coal gasification), and $163.6 thousand for Situation I (electric generating plant) (Table 64). No public utility construction results under Situation II assumptions (electric generating plant).

Changes in Local Tax Revenues

Changes in local tax revenues associated with coal resource development will result from changes in the property tax base; i.e., the plant and mine,

TABLE 61. ESTIMATED COST OF REQUIRED CAPITAL INVESTMENT IN PUBLIC FACILITIES ASSOCIATED WITH ONE GASIFICTION PLANT AND ONE ELECTRIC GENERATING PLANT AND BY SETTLEMENT PATTERNS ($1,000--1972 PRICES)

	Settlement Pattern		Settlement Pattern	
	Coal Gasification Plant Situation I	Coal Gasification Plant Situation II	Electric Generating Plant Situation I	Electric Generating Plant Situation II
Water Distribution System	1,150	185	406	---
Water Treatment Plants	2,435	---	1,377	---
Street Construction	4,322	1,158	2,030	---
School Construction	4,201	None	1,594	---
Waste Water Collection System	768	86	234	---
Waste Water Treatment Facilities	799	60	320	---
Total	13,675	1,489	5,961	

TABLE 62. ESTIMATED EXPENDITURES FOR CONSTRUCTION OF PUBLIC FACILITIES FOR ONE GASIFICATION PLANT AND ONE ELECTRIC GENERATING PLANT AND ESTIMATED GROSS BUSINESS VOUME OF SELECTED SECTORS RESULTING FROM THOSE EXPENDITURES ($1,000--1972 PRICES)

	Coal Gasification Plant Situation I	Coal Gasification Plant Situation II	Electric Generating Plant Situation I	Electric Generating Plant Situation II
Expenditure	13,675	1,489	5,961	---
Sector in Which Gross Business Volume is Generated	Gross Business Volume			
8. Retail Trade	5,604	610	2,443	---
12. Households	8,322	906	3,628	---
4-11. All Businesses	23,298	2,537	10,155	---

TABLE 63. GROSS BUSINESS VOLUMES, TAX ESTIMATORS, AND "ONE-TIME" STATE TAX REVENUES, BY SECTOR AND TYPE OF TAX, RESULTING FROM CONSTRUCTION OF PUBLIC FACILITIES ASSOCIATED WITH A COAL GASIFICATION PLANT AND ALTERNATIVE SETTLEMENT PATTERNS ($1,000--1972 PRICES)

Sector		Type of Tax	Tax Estimator	Situation I		Situation II	
				Gross Business Volume	Tax Revenue	Gross Business Volume	Tax Revenue
8.	Retail Trade	Sales and Use	.04	5,604	224.2	610	24.4
12.	Households	Personal Income	.015	8,322	124.8	906	13.6
4-11.	All Businesses	Corporate Income	.00113	23,298	26.3	2,537	2.9
Total					375.3		40.9

TABLE 64. GROSS BUSINESS VOLUMES, TAX ESTIMATORS, AND "ONE-TIME" STATE TAX REVENUES, BY SECTOR AND TYPE OF TAX, RESULTING FROM CONSTRUCTION OF PUBLIC FACILITIES ASSOCIATED WITH AN ELECTRIC GENERATING PLANT AND ALTERNATIVE SETTLEMENT PATTERNS ($1,000--1972 PRICES)

Sector		Type of Tax	Tax Estimator	Situation I		Situation II	
				Gross Business Volume	Tax Revenue	Gross Business Volume	Tax Revenue
8.	Retail Trade	Sales and Use	.04	2,443	97.7	---	---
12.	Households	Personal Income	.015	3,628	54.4	---	---
4-11.	All Businesses	Corporate Income	.00113	10,155	11.5	---	---
Total					163.6		

new business structures, and new residences. Taxes on these properties will be annually recurring revenues.

Historically, local tax revenues in North Dakota have averaged about 1.65 percent of the market value of the properties.[14] Land and permanent buildings for the mine and gasification plant would be taxable and it has been assumed that about 10 percent of the $66 million capital investment in mines and 15 percent of the $330 million capital investment in the gasification plant would be subject to local property taxes. It has also been assumed that 10 percent of the $51 million capital investment in mines and 15 percent of the $400 million capital investment in electric generating plant would be subject to local property tax. Increased local tax revenues would also accrue from new business structures and residences associated with coal resource development. These revenues were estimated by applying 1.65 percent to the new value of business structures, houses, and apartments and to one-half of the new cost of trailers (based on straight-line depreciation of the trailer). Estimated local tax revenues are presented in Table 65 for coal gasification and Table 66 for electric power generation.

Annually recurring local tax revenues from property taxes on the mine and gasification plant were estimated to be $108.9 thousand and $816.8 thousand, respectively (Table 65). Property taxes on new business structures (to accommodate the increased economic activity) were estimated at $100.7 thousand. These revenues would be expected to be collectible within Mercer County if all the new employees (direct and indirect) are new residents of Mercer County (the assumptions of Situation I). For Situation II, a large part of the local taxes on new business structures could accrue to local governmental units

---

[14] Ostenson, T. K., Associate Professor, Department of Agricultural Economics, North Dakota State University, Fargo, North Dakota.

TABLE 65. ESTIMATED INCREASES IN LOCAL PROPERTY TAX REVENUES RESULTING FROM A COAL GASIFICATION PLANT AND OTHER ASSOCIATED PROPERTIES, BY TYPE OF PROPERTY, SETTLEMENT PATTERN, AND TYPE OF HOUSING ($1,000--1972 PRICES)

	Situation I			Situation II		
Property	Investment	Taxable Value	Tax Revenue	Investment	Taxable Value	Tax Revenue
Mine (10 MMTPY)	66,000	6,600	108.9	66,000	6,600	108.9
Plant (250 MMCFD)	330,000	49,500	816.8	330,000	49,500	816.8
Business Structures	6,100	6,100	100.7	a	a	a
Subtotal			1,026.4			925.7[a]
Houses	57,056	57,056	941.4	9,546	9,546	157.5
Apartments	25,268	25,268	416.9	4,228	4,228	69.8
Trailers	14,649	7,325	120.9	2,451	1,256	20.7
Total Property Tax Revenues on Mine, Plant, Business Structures, and Residences						
Houses			1,967.8			1,083.2[a]
Apartments			1,443.3			995.5[a]
Trailers			1,147.3			946.4[a]

[a] No estimate made as to capital investment required for new business structures within the county.

TABLE 66. ESTIMATED INCREASES IN LOCAL PROPERTY TAX REVENUES RESULTING FROM AN ELECTRIC GENERATING PLANT AND ASSOCIATED PROPERTIES, BY TYPE OF PROPERTY, SETTLEMENT PATTERN, AND TYPE OF HOUSING ($1,000--1972 PRICES)

	Situation I			Situation II		
Property	Investment	Taxable Value	Tax Revenue	Investment	Taxable Value	Tax Revenue
Mine (7.5 MMTPY)	51,000	5,100	84.2	51,000	5,100	84.2
Plant (1,250 MW)	400,000	60,000	990.0	400,000	60,000	990.0
Business Structures	2,896	2,896	47.8			1,074.2
Subtotal			1,122.0			
Houses	21,673	21,673	357.6	----	----	----
Apartments	9,598	9,598	158.4	----	----	----
Trailers	5,564	2,782	45.9	----	----	----
Total Property Tax Revenues on Mine, Plant, Business Structures, and Residences						
Houses			1,479.6			1,074.2
Apartments			1,280.4			1,074.2
Trailers			1,167.9			1,074.2

outside the county. Total local tax collections in Mercer County could increase by a minimum of $946.4 thousand (Situation II, all new residents live in trailers) and as much as $2.0 million (Situation I, all new residents live in houses). Annually recurring local tax revenues vary from 1.1 million tax revenue under Situation II for an electric generating plant to 1.5 million (Situation I, all new residents live in houses) (Table 66).

Changes in Local Public Costs

A large influx of people into Mercer County as a consequence of coal gasification and related economic activity could entail substantial changes in demand for many public services. This analysis was addressed only to those public services for which substantial changes in costs (in dollars and in percent) are likely. These services are primary and secondary education, water treatment and delivery, sewerage collection and treatment, streets and roads, fire and police protection, county government functions, and social services. State government costs and local government services involving minor cost outlays were not considered.

Primary and secondary education account for about 60 percent of the costs of local units of government in North Dakota (Table 67). County and city costs account for 33 percent, leaving less than 6 percent for other costs.

Expenditures for expansion of public services usually involve both capital investments and increased operational costs. Capital expenditures are typically financed by bond issues. Repayment of bonded indebtedness, maintenance of facilities, and operational costs could be financed either by tax revenues or user fees, or a combination of the two.

The magnitude of the increase in costs of public services in the local community as coal resource development occurs depends on the size of the population

TABLE 67. TOTAL PROPERTY TAX LEVIED AND DISTRIBUTION AMONG LOCAL GOVERNMENTS IN NORTH DAKOTA, 1972

Unit of Government	Million Dollars	Percent
Schools	69.1	60.4
Counties	21.7	18.9
Cities	16.1	14.1
Townships	5.4	4.7
State of North Dakota	.7	.6
Miscellaneous	1.5	1.3
	114.5	100.0

SOURCE: Dorgan, B. L., Interim Annual Report of the Tax Commissioner of the State of North Dakota to the State of North Dakota, to the Governor and Legislature, for the One-Year Period July 1, 1972, to June 30, 1973, Office of the Tax Commissioner, Bismarck, North Dakota, December 1, 1973, p. 28.

increase in the area and the capacity of the existing infrastructure to absorb more people. The greater the number of new residents in the area and the less developed the pre-existing set of public services in the area, the greater will be the expenditures required to provide the public services.

The conditions of Situation I and Situation II (described previously) generally define the upper and lower bounds of likely expenditures for public services as a consequence of establishment of a coal gasification or electric generating plant. The greatest expenditures will be required if all the new employees are new residents and if they all live in a central city near the plant. Expenditures for expanded public services will be the least if significant numbers of the new employees already reside in the area and if a substantial number of plant employees commute from outside the community.

Education

The present schools in Mercer County are administered by the five school districts in the county--Beulah, Hazen, Stanton, Zap, and Juzeler. The program offered in these schools is primary and secondary education. It is assumed that no further education beyond the high school level will be offered within the county. Consequently, the change in costs (investment and operation) will result from school capacity expansion. As the enrollment of schools increases, previous studies indicate a higher quality often results.[15] Quality improvement might, therefore, be included in the historical data indicating cost of various sizes of schools. If course offerings had been constant (independent of enrollment and size of the school), more significant economies of size might have been indicated by empirical cost data. However, it was assumed in this study that the school in question provides an average curriculum of the relevant size of school cohort. Quality changes in education other than those implicit to the average costs for each size are ignored.

Four components comprise about 90 percent of total current expenditures in a typical North Dakota school. These major costs are instruction, plant operation, transportation, and administration. Instructional costs comprise about 68 percent of the total (Table 68).

In the fiscal year 1971-72, Mercer County had total education expenditures of $1,150.5 thousand, almost equally distributed between elementary and secondary education. The daily membership in elementary schools was about double that of secondary schools (Table 69).

Enrollment projections in this study are based on the pupil/population ratio. The ratio is determined by the number of pupils and the population from which those pupils came. The ratio was then multiplied by the projected population to estimate future enrollments. More reliable enrollment populations might have been attained if sufficient demographic data, such as age and sex distribution and marriage and birth rates of the immigrating population, had

---

[15] Debertin, D. L., Cost-Size Quality Relationships Affecting North Dakota Schools, unpublished M.S. thesis, Department of Agricultural Economics, North Dakota State University, Fargo, September, 1970.

TABLE 68. PERCENTAGE DISTRIBUTION OF CURRENT EXPENSE PER PUPIL (AVERAGE DAILY MEMBERSHIP) IN RURAL ELEMENTARY AND HIGH SCHOOL DISTRICTS, NORTH DAKOTA, SCHOOL YEAR 1971-72

Type of Expense	Percent of Total Current Expense
Administration	4.24
Instruction	68.85
Attendance Service	0.04
Health Services	0.12
Pupil Transportation Services	7.57
Operation of Plant	8.79
Maintenance of Plant	2.12
Fixed Charges	8.26
Total	99.99

SOURCE: Forty-Second Biennial Report of the Superintendent of Public Instruction for the Period Ending June 30, 1972, North Dakota State Department of Public Instruction, Bismarck, December 31, 1972.

TABLE 69. TOTAL AND PER PUPIL COST OF EDUCATION FOR MERCER COUNTY, FISCAL YEAR 1971-72

School Level	Cost Expenditure	Average Daily Membership	Average Cost Per Pupil
Elementary	590,281.89	1,026.71	727.30
Secondary	560,268.20	488.56	1,296.15
Total	1,150,550.09	1,515.27	908.68

SOURCE: Forty-Second Biennial Report of the Superintendent of Public Instruction for the Period Ending June 30, 1972, Department of Public Instruction, Bismarck, December 31, 1972.

been available. Methods such as regression and correlation analysis could then have been employed.

The pupil/population ratio in Mercer County for the school year 1971-72 was:

$$\frac{\text{Total Enrollment}}{\text{Total Population}} = \frac{1{,}527^{16}}{6{,}175} = 0.25$$

---

[16] State of North Dakota 65th Annual Report of the Director of Secondary Education to Superintendent of Public Instruction for the Year Ending June 30, 1972, North Dakota State Department of Public Instruction, Bismarck, December 31, 1972.

The ratios computed for the two previous years also were about 0.25. The North Dakota ratio for 1971-72 was 0.24.

As indicated in Table 57, the per pupil cost is substantially higher in high school than in elementary school; and, consequently, the ratio of secondary to total enrollment influences the total cost. The ratio of secondary school enrollment to total enrollment in Mercer County for the school year ending June 30, 1972, was:[17]

$$\frac{\text{Enrollment in Secondary School}}{\text{Total School Enrollment}} = \frac{495}{1{,}527} = 0.32$$

The corresponding ratio for North Dakota in 1971-72 also was 0.32. This ratio was applied for converting estimated total enrollment into high school enrollment, which was the base for assigning a school to a size cohort in order to estimte average per pupil cost.

The basis for estimating costs for education for alternative settlement patterns that might be associated with one coal gasification plant and one electric generating plant is presented in Table 70. As described earlier, the assumptions of Situation I involve 2,537 new residents for an electric generating plant or 6,683 new residents for a coal gasification plant concentrated in a city whose previous population was 1,500 (Table 70). The assumptions of Situation II involve 1,119 new residents for a coal gasification plant and no new residents for an electric generating plant distributed among five cities whose previous populations were about 1,500, 1,200, 500, 300, and 200 people, respectively.

Present costs of education for schools located in the five cities were estimated on the basis of estimated enrollment and average per pupil costs for

---

[17] Peterson, M. F., Forty-Second Biennial Report of the Superintendent of Public Instruction for the Period Ending June 30, 1972, Department of Public Instruction, State of North Dakota, Bismarck, December 31, 1972.

TABLE 70. ESTIMATED PRESENT AND PROJECTED EXPENDITURES FOR EDUCATION, ALTERNATIVE SETTLEMENT PATTERNS, ONE COAL GASIFICATION PLANT, AND ONE ELECTRIC GENERATING PLANT, AND INDUCED EMPLOYMENT INCREASES

	Settlement Pattern		Settlement Pattern	
	Situation I Coal Gasification Plant *concentrated population*	Situation II Coal Gasification Plant *dispersed population*	Situation I Electric Generating Plant *concentrated population*	Situation II Electric Generating Plant *dispersed population*
Present Population	1,500	3,700	1,500	3,700
Immigrating Population	6,683	1,119	2,537	None
Total Population	8,183	4,819	4,037	3,700
Estimated Present Population in School District	2,503	6,175	2,503	6,175
Estimated Present School Enrollment	626	1,545	626	1,545
Estimated Present High School Enrollment	200	494	200	494
Current Cost Per Pupil[a] ($)	722.84	764.88	722.84	764.88
Estimated Total Current Cost ($)	452,498	1,181,754	452,498	1,181,754
Estimated Current Cost Per Capita ($)	180.78	191.37	180.78	191.37
School District Population After Immigration	9,186	7,294	5,040	----
School Enrollment After Immigration	2,297	1,824	1,260	----
High School Enrollment After Immigration	735	584	403	----
Current Cost Per Pupil[a] After Immigration ($)	695.17	762.16	717.16	----
Estimated Total Current Cost After Immigration ($)	1,596,805	1,390,183	903,622	----
Estimated Current Cost Per Capita After Immigration ($)	173.83	190.59	179.29	----
Increase in Total Current Cost ($)	1,144,307	208,429	451,124	0
Change in Per Pupil Cost ($)	-27.67	-2.72	-5.68	0
Change in Cost Per Capita ($)	-6.95	-0.78	-1.49	0

[a] No new people settled in Mercer County under assumption II for an electric generating plant.

SOURCE: Peterson, M. F., Forty-Second Biennial Report of the Superintendent of Public Instruction for the Period Ending June 30, 1972, Department of Public Instruction, State of North Dakota, Bismarck, December 31, 1972, p. 181.

those sizes of schools in North Dakota. The population contained in each of the school districts served by schools in those cities was estimated by allocating the 1970 population of Mercer County (6,175 people) among its school districts in proportion to the relative population of those towns (i.e., $\frac{1,500}{3,700} + \frac{1,200}{3,700} + \frac{500}{3,700} + \frac{300}{3,700} + \frac{200}{3,700} = 1.0$). Estimated populations in those school districts were 2,503; 2,003; 834; 501; and 334 (Table 70). The pupil/population ratio (0.25 derived in preceding paragraphs) was used to translate estimated population into estimated school enrollment, which totals 1,545 for the county. The ratio of secondary enrollment/total enrollment (0.32 derived in preceding paragraphs) was applied to those enrollments to obtain estimated high school enrollments. Average per pupil costs for school districts with high schools of that size[18] were applied to the estimated enrollments to obtain total costs of education. Estimated total costs of education for the schools in the five cities were $1.181 million (Table 70). Estimated costs per capita in the school districts were $180.78 in the town of 1,500 population and averaged $191.37 for all five towns.

For the assumptions of Situation I, coal gasification (6,683 new residents in a town whose previous population was 1,500), the total cost of education was estimated to be $1,596,805 (Table 70). Per pupil costs assumed for a school enrollment of 2,297 were $695.17, so per pupil costs under Situation I were $27.67 less after development than before. Per capita costs decreased by $6.95. For Situation II, coal gasification, the estimated decrease in per pupil costs was $2.72 and per capita costs decreased by $00.78. The reason that total costs are less for Situation II is that fewer residents are involved. For the assumptions of Situation I, electric generating plant (2,537 new residents in a town whose previous population was 1,500), the total cost of education was estimated to be $903,622. Per pupil costs assumed for a school enrollment of 1,260 were $717.16, per pupil costs decreased $5.68, and the per capita costs decreased $1.49 for an electric generating plant. There is no change for Situation II, electric generating plants, since no new residents reside in Mercer County under Situation II assumptions.

---

[18] Peterson, op. cit., p. 178.

A larger school enrollment requires more classrooms and other school facilities, but the decline in population over the last few decades has left the county with some empty classrooms. School houses have been vacated after consolidation of the smaller schools. Vacant space capacity in 1972 was estimated to be 283 in Stanton, Hazen, and Beulah--averaging more than 25 percent of present enrollment.[19] These vacated classrooms will probably need repairs before they meet the standard requirements at the time they are taken into use again. However, the costs of updating are assumed to be within normal maintenance costs and are ignored in this study. Taking into account a 25 percent present excess capacity rate of all schools in the county, the requirements for new space are considerably reduced for the dispersed settlement alternative. For the concentrated settlement pattern, any excess capacity was ignored due to the fact that all classrooms are needed in the same central place and any present excess capacity in that place is insignificant compared to the anticipated needs.

Space requirements are greater for high school students than for pupils in elementary school. Average space requirements are estimated to be 92.5

---

[19] Basin Electric Power Cooperative, Environmental Impact Report, Vol. I, Bismarck, North Dakota, April, 1972, p. 104.

and 145.0 square feet per pupil for elementary and secondary schools, respectively. Construction costs per square foot were estimated to be $23 in 1972 prices. By using a fixed rate per square foot, any economies of size are ignored for the school sizes in question. The assumption is supported by information about nationwide construction costs of public elementary and secondary schools for 1969 (Table 71).

TABLE 71. TOTAL CONSTRUCTION COSTS OF PUBLIC ELEMENTARY AND SECONDARY SCHOOLS BY SIZE OF SCHOOL, U.S.A., 1969

Enrollment	Cost Per Pupil
300- 600	2,046
600-1,200	2,090
1,200-2,500	2,159
2,500-5,000	2,034
5,000-10,000	2,121

SOURCE: "Cost of Construction," School Management, Vol. 14, July, 1970, pp. 15-35.

An increase in enrollment of 1,671 for the concentrated settlement pattern (Situation I for a coal gasification plant) will require a school construction expenditure of $4,201,065 in 1972 prices (Table 72). For the dispersed settlement pattern where existing excess capacity of 382 student spaces are considered, no investment is needed due to excess capacity exceeding new enrollment. For Situation I, electric generating plant, 634 new students will require a school construction expenditure of $1,593,969 (Table 72).

Road and Street Services

Construction and maintenance of public roads and streets are the responsibility of several administrative jurisdictions: federal, state, and county governments, as well as organized townships and incorporated cities. The federal jurisdiction maintains roads in national parks, forests, and reservations; while the interstate highway and state primary secondary highways are

TABLE 72. ESTIMATED CONSTRUCTION COST OF SCHOOL EXPANSION ASSOCIATED WITH ONE GASIFICATION PLANT AND ONE ELECTRIC GENERATING PLANT AND ALTERNATIVE SETTLEMENT PATTERNS

	Settlement Pattern		Settlement Pattern	
	Situation I Coal Gasification Plant	Situation II Coal Gasification Plant	Situation I Electric Generating Plant	Situation II Electric Generating Plant
	concentrated population	dispersed population	concentrated population	dispersed population
Present Population	1,500	3,700	1,500	3,700
Immigrating Population	6,683	1,119	2,537	----
Total Population	8,183	4,819	4,037	3,700
Increase in Enrollment After Immigration[a]	1,671	279	634	
Estimated Present Vacant Capacity, Pupil Places	0	382	0	
Estimated Requirement for Expansion, Pupil Places	1,671	0	634	
Estimated Requirement for Secondary Expansion, Pupil Places	535	0	203	
Estimated Requirement for Elementary Expansion, Pupil Places	1,136	0	431	
No. Square Feet of Secondary Expansion[b]	77,575	0	29,435	
No. Square Feet of Elementary Expansion[c]	105,080	0	39,868	
Total Need for Expansion, Square Feet	182,655	0	69,303	
Estimated Cost of Expansion[d] ($)	$4,201,065	None	$1,593,969	

[a] Obtained from Table 64.

[b] Secondary school: 145 square feet per pupil.

[c] Elementary school: 92.5 square feet per pupil.

[d] Cost per square foot: $23 (1972 prices).

SOURCE: Information under footnotes b, c, and d are derived from data obtained from the North Dakota State Department of Public Instruction, Bismarck, July, 1974.

the responsibility of the state. Highway routes may extend into or through municipal areas so as to connect the rural parts of the routes. County highways consist of the designated federal highway aid system of local roads and a regular county road system. These routes may also extend through municipalities. Township roads serve local rural travel, while municipalities maintain their own arterial and other street systems.[20]

This study will be concerned mainly with those road systems of Mercer County which are fully or partly financed from local sources.

Maintenance costs of streets depend on street mileage and the amount of traffic they convey. Average statewide maintenance cost per mile in cities with more than 1,000 inhabitants is about four times greater than in cities with fewer than 1,000 people (Table 73).

TABLE 73. NORTH DAKOTA STATEWIDE AVERAGE COST FOR MAINTENANCE OF CITY STREETS IN 1972

Number of Inhabitants	Dollars Per Mile
Under 1,000	566
1,000-4,999	2,085
5,000 & Over	2,672

SOURCE: North Dakota Highway Statistics, 1973, North Dakota State Highway Department, Planning and Research Division in cooperation with the United States Department of Transportation, Federal Highway Administration, Bismarck, p. 50.

The procedure for estimating the increased street construction and maintenance costs were similar to those used in the previous section for estimating costs of education. A population density of 15 persons per acre in blocks 300 feet by 300 feet with 66-foot wide streets results in 0.0030 mile of street per person. The total street mileage of a hypothetical city can be derived by multiplying the population by the mileage-per-person ratio. Maintenance costs are estimated by multiplying the relevant per mile cost (Table 73) by the mileage (Table 74). The increase in total maintenance cost resulting from enlargement of the city is the difference between total cost after expansion and the cost of the present city. For the concentrated settlement pattern assumption for a coal gasification plant, the increase in total annual maintenance cost was estimated to be over $56,000. The per capita increase is $1.74. The dispersed settlement alternative for a coal gasification plant results in an estimated annual increase of $5,780 in maintenance costs--which is $0.04 per capita (Table 74). The concentrated settlement pattern for an electric generating plant involved an increase in $15,846 in total maintenance costs with virtually no change in per capita costs (Table 74).

---

[20] North Dakota Highway Statistics, 1973, The North Dakota State Highway Department, Bismarck, pp. 1-68.

Investment costs of streets involve hypothetical extensions of present cities based on assumptions for the alternative settlement patterns. The city must be enlarged by the number of blocks (300' x 300') required to accommodate the immigrating population. Streets between the blocks are assumed to be 66 feet wide and each block is assumed to hold 46.125 people (15 persons per acre).

The streets in the new and old parts of the city have to be surfaced according to the traffic frequency expected. A traffic frequency of one trip per day per person was assumed. Total construction and updating[21] cost for a city to grow from 1,500 people to 8,183 (concentrated settlement pattern coal gasification plant) was estimated to be $4.3 million (Table 75). Updating of existing streets and construction of new ones for the (dispersed settlement pattern coal gasification plant) was estimated to cost $1,157,609.

---

[21] Updating involves adding layers of surfacing to accommodate increased traffic.

TABLE 74. ESTIMATED STREET MAINTENANCE COST BEFORE AND AFTER CITY EXPANSION FOR ONE GASIFICATION PLANT AND ONE ELECTRIC GENERATING PLANT AND ALTERNATIVE SETTLEMENT PATTERNS

	Settlement Pattern		Settlement Pattern	
	Situation I Coal Gasification Plant	Situation II Coal Gasification Plant	Situation I Electric Generating Plant	Situation II Electric Generating Plant
	concentrated population	*dispersed population*	*concentrated population*	*dispersed population*
Present Population	1,500	3,700	1,500	3,700
Immigrating Population	6,683	1,119	2,537	----
Total Population	8,183	4,819	4,037	3,700
Present Estimated Mileage	4.50	11.10	4.50	11.10
Maintenance Cost Per Mile	2,085	----	2,085	----
Total Present Maintenance Cost	9,383	18,586	9,383	18,586
Present Maintenance Cost Per Capita	6.26	5.02	6.26	5.02
Required Total Mileage After Expansion	24.5	14.5	12.1	----
Maintenance Cost Per Mile After Expansion	2,672	----	2,085	----
Total Maintenance Cost After Expansion	65,464	24,366	25,229	----
Total Maintenance Cost Per Capita After Expansion	8.00	5.06	6.25	----
Increase in Total Maintenance Cost	56,081	5,780	15,846	----
Increase in Per Capita Maintenance Cost	1.74	.04	-.01	----

The construction cost of new streets is consistent with cost estimates based on statewide average costs per mile of $200,566 reported by the North Dakota State Highway Department.[22] An expansion mileage of 20.0 (0.003 mile per person times 6,683 people) at a per mile cost of $200,566 (64-foot curb and gutter section) amounts to $4.001 million which compares closely to $4.322 million in Table 75.

Beyond the assumed levels of city street construction and maintenance, it is assumed in this study that no significant expansion in development of the state and county road systems in Mercer County is required. However, increased traffic on the county's road system may cause some increase in maintenance costs. No estimates were made of these increased costs because of inadequate data on which to base such estimates. However, they appear to be of a rather insignificant burden on the county.

About 25 percent of Mercer County's total expenditures of $396,754 for local roads and streets in the year ending June 30, 1972, were met by county funds (levied property tax amounted to $102,913; i.e., $16.19 per person).[23] The remaining funds were state and federal apportionments. Consequently, the majority of any cost increases conceivably could be nonlocal funds.

Costs of maintenance and construction on incorporated city streets may be paid by appropriations from the city general fund and from the city's share of a common state fund receiving revenues from motor vehicle registration fees, motor fuel taxes, ton fees, motor vehicle use tax, and a 2 percent special excise tax.[24] However, it was decided for this study not to make any attempt to allocate local and nonlocal funds for meeting the costs of city streets.

---

[22] North Dakota Highway Statistics, 1973, op. cit., p. 50.
[23] Ibid., pp. 54-57.
[24] Ibid., p. 48.

TABLE 75. ESTIMATED COSTS OF STREET CONSTRUCTION AND UPDATING OF PRESENT STREETS ASSOCIATED WITH ONE GASIFICATION PLANT AND ONE ELECTRIC GENERATING PLANT AND ALTERNATIVE SETTLEMENT PATTERNS

	Settlement Pattern		Settlement Pattern	
	Situation I Coal Gasification Plant	Situation II Coal Gasification Plant	Situation I Electric Generating Plant	Situation II Electric Generating Plant
	concentrated population	dispersed population	concentrated population	dispersed population
Present Population	1,500	3,700	1,500	3,700
Immigrating Population	6,683	1,119	2,537	----
Total Population	8,183	4,819	4,037	3,700
Updating Cost, Per Capita of Present Population[a] ($)	231.80	231.80[b]	231.80	----
Total Updating Cost ($)	347,700	625,860	521,550	----
Expansion Cost Per Capita[a] ($)	594.70	475.20	594.70	----
Total Expansion Cost ($)	3,974,380	531,749	1,508,754	----
Total Updating and Expansion Cost ($)	4,322,080	1,157,609	2,030,304	----
Total Per Capita Cost of Updating and Expansion[c] ($)	528.18	240.22	502.92	----

[a] Updating and expansion costs (1972 prices) are derived from information obtained from North Central Consultants, Ltd., Jamestown, North Dakota, July, 1974.

[b] Updating cost of $231.80 per capita for 2,700 people.

[c] Total cost divided by total population.

Distribution and Treatment of Water

Operational costs and repayments of loans for investments in water systems are principally financed by user fees charged to those benefiting from public water service. Any change in costs (operational or investment expenses) ordinarily would not affect the tax levies or the general funds of the cities. An influx of people would, however, require some expansion of present water systems or construction of new plants that, together with other public construction, might have some impacts on the local economy.

In order to estimate the cost of distributing water to new city blocks, it is assumed that new lines are installed with no modification of the present pipes serving the old parts of the city. Further, it is assumed that the present supply of water is sufficient for future consumption and no costs for drilling or exploration of new sources are included. Capacity of the new line is sized to be sufficient to deliver maximum daily flow simultaneously with required fire flow. The average daily consumption per capita is stipulated to be 150 gallons, but ranges from 40 to 230 gallons. Hydrants are assumed to cover 125,660 square feet each. Arteries are not spaced more than 3,000 feet apart, and secondary feeders no more than 3,000 feet apart.

A water distribution system for a population of about 7,500 people is estimated to cost $172.02 per capita (1972 prices), while the per capita cost for smaller populations of about 1,000 is estimated to be $165.43. Total investment in a water distribution system was estimated to be $1,149,610 for the concentrated settlement pattern coal gasification plant and $185,116 for the dispersed settlement alternative (Table 76).

Water treatment facilities vary with the needs for treatment; i.e., they depend on the quality of the water supply. At present, there are in the cities of the area, a treatment plant in Beulah; while chlorination, fluoridation, and

TABLE 76. ESTIMATED PER CAPITA AND TOTAL COST OF WATER DISTRIBUTION SYSTEM AND TREATMENT FACILITIES ASSOCIATED WITH ONE GASIFICATION PLANT AND ONE ELECTRIC GENERATING PLANT AND ALTERNATIVE SETTLEMENT PATTERNS

	Settlement Pattern		Settlement Pattern	
	Situation I Coal Gasification Plant	Situation II Coal Gasification Plant	Situation I Electric Generating Plant	Situation II Electric Generating Plant
	concentrated population	*dispersed population*	*concentrated population*	*dispersed population*
Present Population	1,500	3,700	1,500	3,700
Immigrating Population	6,683	1,119	2,537	----
Total Population	8,183	4,819	4,037	3,700
Expansion, Water Distribution, Cost Per Capita for Immigrating Population	172.02	165.43	160.20	----
Total Cost Expansion Water System	1,149,610	185,116	406,427	----
Expansion, Water Treatment, Cost Per Capita[a]	364.42	----	542.82	----
Total Cost Expansion, Water Treatment Plant	2,435,419	----	1,377,134	----
Total Cost Expansion Water Distribution and Treatment	3,585,029	185,116	1,783,561	----
Per Capita Cost, Water Distribution, and Treatment	438.11	38.41	441.80	----

[a] Information about cost per capita is obtained from North Central Consultants, Ltd. Jamestown, North Dakota (1972 prices).

iron removal is undertaken for the water provided in Hazen.[25] For the dispersed settlement alternative, it is assumed that no further investments would be needed for water treatment facilities in the small cities. For the concentrated settlement pattern (coal gasification plant), however, a treatment plant is assumed to be installed at an estimated cost of $2.4 million; i.e., $364.42 per capita (Table 76). Total investments for a distribution system and treatment plant total $3,585,029 for the concentrated settlement alternative (coal gasification plant); whereas, the total remains at $185,116 for the dispersed alternative with no further investments undertaken in treatment plants (Table 76). The concentrated settlement pattern for an electric generating plant results in $1.4 million investment in a treatment plant at $542.82 per capita and $406,427 investment in expansion of a water distribution system. Total costs of water distributions and treatment are $1,783,561 at $441.80 per capita.

Waste Water System and Waste Water Treatment

Investments and operational costs of sewer systems in the area are principally financed through user fees and loans and grants through various federal programs, such as Farmers Home Administration, Environmental Protection Agency, and Federal Water Pollution Control Administration. Sewer system expenditures are, therefore, not financed through the local general funds and likely will not be charged against the recurring local tax revenues discussed previously.

According to a survey conducted in 1972, the municipal sewer systems of all cities in Mercer County, except Pick City, were given an EPA (Environmental Protection Agency) designation of 7 ("no project needed.")[26] (See Appendix

---

[25] Impact of Coal Development in Mercer County, Draft Report, Old West Regional Commission, Washington, D.C., July 30, 1974.

[26] Voelker, Stanley, Inventory of Municipal Sewage Systems, North Dakota, Cities and Village With 1960 Populations of 75 to 10,000, Fargo, North Dakota September 15, 1972, unpublished.

Table 51.) It is, therefore, assumed that present sewage systems are appropriate for the present population's requirements under the dispersed settlement alternative for a coal gasification plant.

Cost estimates are based on the following criteria:[27]

1. About 70 percent of the water brought into a community must be removed as "spent water."
2. Average flow is 100 gallons per capita daily. Variations in water use increase the required maximum hourly rate about threefold. Storm water and groundwater magnify the capacity further and a design value of 400 gallons per capita daily is used.
3. Minimum velocity of 2.5 feet per second is required for self-cleaning.
4. Manholes are required at each change in grade or direction, or at a maximum distance of 366 feet for cleaning purposes.
5. Six-inch laterals are needed to serve each individual residence at a cost of $5.00 per foot from the service entrance of the house to the sewer main.

The major sewer costs for the dispersed settlement pattern (coal gasification plant) are the costs of extension to the new city blocks. Total investments are estimated to be $86,510 (Table 77). The corresponding investment for the concentrated settlement pattern is $768,541. A treatment plant, including activated sludge units as well as primary treatment, is reported to cost about $102.90 per capita for a population of about 7,500.[28] A 1972 cost of $97.65 per capita for the entire population under the concentrated settlement pattern (coal gasification) results in an investment cost of $799,070 for treatment and a total investment of $1,567,611 in the collection

---

[27] Information is obtained from North Central Consultants, Ltd.,Jamestown, North Dakota, July, 1974.

[28] Information obtained from North Central Consultants, Ltd., Jamestown, North Dakota, August, 1974.

TABLE 77. ESTIMATED INVESTMENT COSTS FOR WASTE-WATER SYSTEM AND TREATMENT FACILITIES ASSOCIATED WITH ONE GASIFICATION PLANT AND ONE ELECTRIC GENERATING PLANT AND ALTERNATIVE SETTLEMENT PATTERNS

	Settlement Pattern		Settlement Pattern	
	Situation I Coal Gasification Plant *concentrated population*	Situation II Coal Gasification Plant *dispersed population*	Situation I Electric Generating Plant *concentrated population*	Situation II Electric Generating Plant *dispersed population*
Present Population	1,500	3,700	1,500	3,700
Immigrating Population	6,683	1,119	2,537	----
Total Population	8,183	4,819	4,037	3,700
Modification of Sewer System, Cost Per Capita ($) (present)	54.09	----[a]	14.42	----
Expansion Sewer System, Cost Per Capita for Immigrating Population ($)	102.41	77.31	83.61	----
Total Modification Cost ($)	84,135	----	21,630	----
Total Expansion Cost ($)	684,406	86,510	212,119	----
Total Additional Investment Sewer System ($)	768,541	86,510	233,749	----
Treatment Plant/Lagoons ($)	799,070	60,426	320,068	----
Total Investments ($)	1,567,611	146,936	553,817	----
Total Investment Per Capita ($)	191.57	30.49	137.19	----

[a] No modification cost is included for the dispersed settlement pattern coal gasification plant.

system and treatment plant. For the dispersed settlement pattern, the present lagoons of the cities in the area are considered adequate for the present population's needs. Any excess capacity that might exist is ignored, and a lagoon extension of one acre per 100 people is assumed at a cost of $5,400 per acre ($6,000--1974 prices).[29] Total expansion cost for treatment is estimated to be $60,426 and total investments for the dispersed settlement alternative (coal gasification plant) is estimated to be $146,936.

The concentrated settlement pattern for an electric generating plant results in an investment cost of $320,068 for a treatment plant including activated sludge units as well as primary treatment (1972 cost of $126.16 per capita)[30] and a total cost of $553,817. No new people live in Mercer County under Situation II assumptions for an electric generating plant.

Solid Waste Handling and Disposal

Collection and disposal of solid waste is principally financed by user fee charges and should not represent any burden on the cities' general fund. It is assumed in this study that any increased expenditures resulting from population growth are charged to the users of the service. No substantial impact is anticipated from the limited investments needed for capacity expansions to meet the requirements. Even for a city growing to 8,183 (concentrated settlement pattern coal gasification plant), only one additional truck handling solid waste for 5,727 people[31] would be needed. Each truck is estimated to cost $11,400 (1972 prices). Additional land required, at $950 an acre, is estimated to cost $18,779. Some landfill equipment might be required, depending on what is available at present. Trucks and land would amount to $30,179 in addition to the cost of a bulldozer, loader, or other landfill equipment if present available equipment is inadequate. These limited investments for solid waste handling and disposal were ignored in estimating the impacts resulting from construction of public facilities.

---

[29] Impact of Coal Development in Mercer County, op. cit.

[30] North Central Consultants, op. cit.

[31] North Central Consultants, op. cit.

Police and Fire Protection Services

Police protection in rural areas is the responsibility of the county sheriff's office. Cities having city policemen finance that part of their own police protection. Deputy sheriffs are assigned to some cities in the area and their salaries are paid primarily by federal funds. The present police staff in most of the cities can serve a greater population than is served at present. A capacity expansion may be financed partly from federal sources. The increase in per capita police protection expenditure for the dispersed settlement pattern (coal gasification and electric generating plant) should, therefore, be insignificant; but some increase in total cost might occur due to additional staff and mileage allowances. For the concentrated settlement alternative (coal gasification plant), an increase in per capita costs might occur as police expenditures per capita seem to increase with city size (Table 78). The weighted average of per

TABLE 78. POLICE EXPENDITURES, TOTAL AND PER CAPITA, FOR NORTH DAKOTA CITIES WITH MORE THAN 10,000 INHABITANTS, 1971

City	1970 Population	Total Police Expenditures	Total Expenditures Per Capita
		thousand dollars	*dollars*
Fargo	53,365	1,136	21.29
Grand Forks	39,008	785	20.12
Bismarck	34,703	620	17.87
Minot	32,290	437	13.53
Jamestown	15,385	221	14.36
Dickinson	12,405	179	14.43
Average			16.93

SOURCE: The Municipal Year Book 1973, International City Management Association, Washington, D.C., January, 1973, pp. 218-283.

capita police expenditures in North Dakota cities with more than 10,000 inhabitants was $18.05 for 1971. The simple arithmetic mean of the per capita costs for all cities was $16.93. In the absence of detailed data for each size of city in North Dakota, the arithmetic mean of $16.93 (1972 price level) was used to estimate the total expenditures of police protection for an increased population of 6,683 people in a city whose previous population was 1,500 (concentrated settlement alternative coal gasification plant). Increased annual expenditures were estimated to be $113,143 (Table 79). Increased police expenditures associated with the concentrated settlement pattern (electric generating plant) were not determined due to lack of data sources for that size of city.

TABLE 79. ESTIMATED ADDITIONAL OPERATIONAL POLICE AND FIRE PROTECTION COSTS DUE TO CITY EXPANSION ASSOCIATED WITH ONE GASIFICATION PLANT AND CONCENTRATED SETTLEMENT PATTERN

Service	Cost Per Capita	Population Increase	Estimated Increase, Annual Expenditures
Police Protection	$16.93	6,683	$113,143
Fire Protection	12.33	6,683	82,401

The $16.93 and $12.33 average per capita cost for police and fire protection may be somewhat high for 6,683 additional residents added to a city whose former population was 1,500 people. However, police and fire cost data on cities below 10,000 population is not readily available so the average cost for cities in North Dakota above 10,000 population was used for fire and police protection for the concentrated settlement pattern (coal gasification plant).

Fire departments of the cities in the area are reported to have a substantial excess capacity and are assumed to handle the anticipated population increase under the dispersed settlement alternatives.[32] Consequently, no significant increase in fire protection expenditures are expected for those limited population increases. For the concentrated settlement alternative, a greater cost increase is anticipated--either due to less utilization of present excess capacity and/or a probable higher per capita cost.

---

[32] *Impact of Coal Development in Mercer County*, *op. cit.*

Available data about total fire protection expenditures for four North Dakota cities with a population of more than 10,000 indicate an increasing per capita cost as the city population grows (Table 80). The arithmetic mean of per capita expenditures ($12.33) was applied to the increased population of 6,683 (concentrated population assumptions coal gasification plant). The resulting cost was estimated to be $82,401 (Table 79).

TABLE 80. FIRE DEPARTMENT EXPENDITURES, TOTAL AND PER CAPITA, FOR NORTH DAKOTA CITIES WITH MORE THAN 10,000 INHABITANTS, 1971

City	1970 Population	Total Fire Protection Expenditures	Total Expenditures Per Capita
		thousand dollars	*dollars*
Fargo	53,365	993	18.61
Grand Forks	39,008	540	13.84
Bismarck	34,703	360	10.37
Jamestown	15,385	100	6.50
Average			12.33

SOURCE: The Municipal Year Book 1973, International City Management Association, Washington, D.C., January, 1973, pp. 218-283.

Local Government Offices

Some functions of the county government are financed solely by local funds, i.e., from property tax. The functions are usually classified as general government and include: board of county commissioners, auditor, treasurer, register of deeds, states attorney, sheriff, clerk of court, buildings and grounds, county judge, district court, and juvenile court.

Belter conducted a study in 1970 of annual costs of county government for 14 counties in North Dakota State Planning Regions V and VIII.[33] Per capita costs for selected county functions were regressed against population to determine the relationship between per capita costs and population. The best-fit equation is:

$$Y = \frac{1}{0.0337 + 0.0076X + (-0.0001X^2)}$$

where Y = cost per capita in dollars and X = population in thousands.

The expenditures used in the study were average figures from the period 1960-1969. In order to update the values computed for the equation to 1972 prices, the per capita costs were multiplied by a factor $(1.026)^7$, which represents the effect of seven years of annual inflation of 2.6 percent.

For the dispersed settlement alternative (coal gasification plant), the costs of general government functions will increase by $7,951 and for the concentrated settlement pattern (coal gasification plant) by $37,733 (Table 81). The estimated per capita cost declined $1.30 and $5.16, respectively. For the concentrated settlement pattern (electric generating plant) the costs of general government functions will increase by $16,788 and per capita costs will decline 2.61 (Table 81).

Besides the increase in annual expenditures, it may be necessary to expand the various permanent facilities. The new county courthouse in Stanton is considered capable of serving a considerably larger population. Because the population increases are assigned only to cities, needs for rural police protection should not be affected to the same extent as the total population increases. However, some extensions of the sheriff's office and county jail might be needed. Being of limited importance, impacts from construction of any new facilities at the county level were ignored in this study.

---

[33] Belter, W. R., County Government Costs in North Dakota, unpublished M.S. thesis, Department of Agricultural Economics, North Dakota State University, Fargo, North Dakota, September, 1970.

TABLE 31. ESTIMATED ANNUAL COST OF GENERAL COUNTY GOVERNMENT FUNCTIONS ASSOCIATED WITH ONE GASIFICATION PLANT AND ONE ELECTRIC GENERATING PLANT AND ALTERNATIVE SETTLEMENT PATTERNS

	Present Situation	Settlement Pattern		Settlement Pattern	
		Situation I Coal Gasification Plant	Situation II Coal Gasification Plant	Situation I Electric Generating Plant	Situation II Electric Generating Plant
		concentrated population	*dispersed population*	*concentrated population*	*dispersed population*
Population After Immigration	6,175	12,858	7,294	8,712	6,175
Estimated Expenditures Per Capita ($)	15.58	10.42	14.28	12.97	15.58
Total Estimated Expenditures ($)	96,207	133,980	104,158	112,995	96,207
Total Estimated Increase ($)	0	37,733	7,951	16,788	0
Estimated Change Per Capita ($)	0	-5.16	-1.30	-2.61	0

General government services facilities at the municipal level have a substantial excess capacity in most of the cities and only minor expansions of the city halls should be required for any of the settlement patterns.

Social Services

The social service program is operated by the State and County Welfare Board. The financing of administrative expenditures and payments to or for recipients is made jointly from federal, state, and county sources. In Mercer County, for the period July 1, 1972-June 30, 1973, the total payments and expenditures amounted to $377,438. Federal sources reimbursed $261,674 and state funds provided $82,626, leaving $33,137 to be covered by the county; i.e., $5.37 per capita (Table 82). If one assumes the per capita expense to be independent of the population, the county total payments would increase $35,888 for the concentrated settlement pattern and $6,009 for the dispersed alternative (coal gasification). The county total payments would increase by $13,624 for the concentrated settlement pattern (electric generating plant). Due to the immigrants' unknown origins (whether from out-of-state or not), it was not feasible to estimate any change in state expenditures. No change in state expenditures would accrue for current North Dakota residents immigrating to Mercer County.

TABLE 82. ADMINISTRATIVE, SERVICE, AND TRAINING EXPENSE FOR COUNTY WELFARE BOARD, STATE OFFICE AND AREA SOCIAL SERVICE CENTERS TOGETHER WITH PAYMENTS TO OR FOR RECIPIENTS BY SOURCE OF FUNDS, MERCER COUNTY, JULY 1, 1972-JUNE 30, 1973

	County	State	Federal	Total
Administrative, Service and Training Expense ($)	16,723.38	15.07	26,748.77	43,487.22
Payments to or for Recipients ($)	16,413.91	82,611.35	234,925.60	333,950.86
Total ($)	33,137.29	82,626.42	261,674.37	377,438.08

SOURCE: Social Services in North Dakota, First Annual Report of the Social Service Board of North Dakota for the Period Ending June 30, 1973, Bismarck.

Other Services

There are several other public services financed by county and state funds, such as library, parks, recreation, and other items, that might be included in "miscellaneous." The individual service might be of a substantial financial burden for the single municipality when the facilities are under modernization or expansion. However, for the county or state as a whole, these services represent minor financial burdens and no attempt was made to estimate any associated impacts resulting from coal development.

Comparisons of Costs and Revenues

This section of the report provides information on the extent to which present and projected revenue sources for public services are sufficient to meet anticipated increases in public costs. The objective was to estimate changes in costs of selected services and to estimate changes in state and local revenues associated with one 250 MMCFD coal gasification plant (and associated mine) and one 1,250 MW electric generating plant (and associated mine). Two hypothetical settlement patterns were assumed to reflect the possible extremes or upper and lower bounds of selected public costs and revenues.

Due to the fact that not all costs and revenues were considered in this study, any conclusions drawn from comparisons of total estimated revenues and expenditures would be inappropriate, changes in annual local property taxes associated with operation of a coal gasification plant, and associated properties were estimated to vary from $1.0 million at minimum (Situation II-trailer combination) to $2.0 million at maximum (Situation I-house combination). Changes in annual local property taxes associated with operation of an electric generating plant vary from $1.1 million at minimum (Situation II) to $1.5 million at maximum (Situation I-house combination). State collectible taxes were estimated to increase by $1.1 million annually for operation of a coal gasification plant and $.5 million annually for an electric generating plant.

Recurring expenditures in Mercer County were estimated to increase from $.2 million to $1.5 million annually for operation of a coal gasification plant and from no increase in annually recurring expenditures to $.5 million for operation of an electric generating plant, with adjustments for nonlocal education support.

In order to obtain more complete and reliable projections of local fiscal impacts resulting from coal development, intergovernmental transfers should be taken into account. The projections would be more accurate if minor sources of revenues and more areas of expenditures were analyzed. Individually, each of the small cost and revenue items might be of minor importance; totally, they may add to substantial amounts. However, the range of expenditures and revenues presented in this section provide a general indication of the impact that would be associated with a coal gasification or an electric generating plant.

SECTION VI, APPENDIX A, TABLES AND FIGURES

Introduction

The major study area comprises Mercer, Dunn, McLean, and Oliver counties. This report concentrates its review of background socioeconomic characteristics most extensively on these four counties; however, socioeconomic characteristics of the three most densely populated counties (Burleigh, Morton, and Stark) located near the major study area are also reviewed, where appropriate. Burleigh, Morton, and Stark counties are apt to bear a significant share of the expanded coal development impact occuring in the four county major study area. In addition, several socioeconomic characteristics are provided for all counties located in Regions 7 and 8 of North Dakota.

Study Area

Appendix Figure 1 shows the major highway systems, railroad systems, towns, and rivers in the seven county area of Mercer, McLean, Dunn, Oliver and Burleigh, Morton, and Stark counties.

Population Characteristics

The major study area is characterized by an extremely rural population. Appendix Table 1 indicates the total population of the four counties was 24,643 in 1970--a decline of 17 percent from 1960's population of 29,745. Oliver County had the smallest population in 1970 with 2,322, while McLean County had the largest population with 11,251 people. The population density for the four county area was 3.95 persons per square mile in 1970. Table 1, Section 1 of the text, shows 6,247 square miles of total land surface in the major study area which was inhabited by 24,643 people in 1970. The entire four county area is considered rural with no county containing a city above 2,500 population. Beulah in Mercer County is the largest city in the major study area with 1,344 people. Appendix Table 2 shows the total population of Burleigh, Morton, and Stark counties. In 1970, 80,637 people lived in Burleigh, Morton, and Stark counties--a 9.8 percent increase from the 1960 population of 73,459 people. The cities of Bismarck, Mandan, and Dickinson located in Burleigh, Morton, and Stark counties had 1970 populations of 34,703, 11,093, and 12,405, respectively.

During the decade of the 1960's the four major study counties witnessed population decreases characterized by a high rate of population net out-migration (Appendix Figure 2). Burleigh County is the only county in the seven county area that had a population increase, with net in-migration.

Appendix Table 3 indicates the major study area population by age and sex cohorts. The age and sex cohorts of Burleigh, Morton, and Stark counties and North Dakota are shown in Appendix Table 4. Communities witnessing high rates of net out-migration generally have higher percentages of people under 25 and over 65 and a smaller percentage of people in the prime working age cohorts than the national average. For example, Appendix Table 5 illustrates the total people in the labor force 16 years of age and over by age and sex cohort. North Dakota in 1970 had 40.3 percent of its male labor force between the ages of 25 and 44; whereas, only 32.4 percent in Dunn, 35.3 percent in McLean, 38.2 percent in Mercer, and 40.4 percent in Oliver's male labor force were in the age cohorts 25 to 44. Appendix Table 6 illustrates that Burleigh, Morton, and Stark counties averaged 44.8 percent of its male labor force between the ages of 25 and 44, which is well above the 35.9 percent average for Mercer, McLean, Dunn, and Oliver counties. Burleigh, Morton, and Stark counties have not witnessed as high a rate of net out-migration as the four county major study area and as a result may have labor that could work directly or indirectly in jobs created as a result of coal development in the Mercer County area.

Race

Race of the major study area population is predominately white; but in 1970, 1,021 people or approximately 4 percent of the major study area's population were Indians (Appendix Table 7). McLean, Mercer, and Dunn counties all contain portions of the Fort Berthold Indian Reservation.

Education

Years of school completed by persons over 25 in the study area and North Dakota are shown in Appendix Tables 8 and 9. The major study area has a much higher percentage of people with eight years of education or less than North Dakota as a whole. Mercer County in 1970 had over 61 percent of its population over 25 with eight years or less of school compared to 37.6 percent for North Dakota and 38.8 percent for Burleigh, Morton, and Stark counties. Appendix Tables 10 and 11 indicate the persons in the study area and North Dakota 3 to 34 years of age who are enrolled in school. Appendix Tables 12 and 13 show persons 16 to 64 with less than three years of college by vocational training.

Income and Earnings

Appendix Tables 14 and 15 show the total family income for the seven county area and North Dakota. The average family income in the four county major study area in 1970 was substantially below the North Dakota average family income of $9,085. Average family income ranged from $7,287 in Oliver County to $8,389 in Dunn County. The average family income for Burleigh, Morton, and Stark counties was $10,291, $8,053, and $8,464, respectively.

The percent of males 16 years old and over in the experienced civilian labor force by earnings and occupation for the study area and

North Dakota is illustrated in Appendix Tables 16 through 23. In Oliver, Mercer, McLean, and Dunn counties 43.3 percent of the experienced male labor force were farmers, 23.5 percent of those farmers had earnings between $3,000 and $4,999. In Burleigh, Morton, and Stark counties 11.9 percent of the total experienced labor force were farmers and 23.5 percent of these farmers had earnings between $3,000 and $4,999. North Dakota's experienced male labor force included 24.5 percent farmers; 20.7 percent of the North Dakota farmers had earnings between $3,000 and $4,999. Appendix Tables 24 through 27 indicate the experienced females in the labor force from 16 years of age and over by earnings and occupation for the seven counties and North Dakota.

Labor Force and Employment

Appendix Table 28 indicates the total labor force 16 years of age and older in the major study area and North Dakota. The major study area had 8,115 employed and 372 unemployed persons in the labor force, excluding armed forces, in 1970, indicating an unemployment rate of 4.6 percent. Burleigh, Morton, and Stark had 29,029 employed and 1,458 unemployed persons in the labor force, excluding armed forces, in 1970, 5.0 percent were unemployed (Appendix Table 29).

Appendix Tables 30 and 31 indicate the count of employed persons 16 years old and over by census industry category and sex for the seven county study area in 1970. The agriculture, forestry and fisheries category had the highest percentage of employed people in all counties except Burleigh County, which contains the state capital at Bismarck. Employed persons in the study area by census occupational category are illustrated in Appendix Tables 32 and 33.

Underemployment estimates in 1960 for the study area are shown in Appendix Tables 34 and 35. Underemployment estimates for males ranged from 63 percent in Oliver to 13.7 percent in Mercer. This seems to indicate that a substantial amount of indigenous labor could come "out of the woodworks" in the event of substantial coal development in the study area. Another indication of the potential availability of a local labor pool is the number of weeks worked in a year. Appendix Tables 36 and 37 indicate the number of weeks worked by age cohort for males in the seven county study area and North Dakota. For example in McLean County over 14 percent of its male labor force, age 25-64, worked only 14 to 27 weeks compared to 9.2 percent for North Dakota. The number of weeks worked by females 16 years of age and over by age cohort is shown in Appendix Tables 38 and 39. A substantial employment potential exists among the female work force.

The labor force participation rates for the seven counties are shown in Appendix Tables 40 and 41. The average male labor force participation rate varies from 81.5 percent in Dunn County to 70.3 percent in McLean County. The female labor participation rate varies from 46.8 percent in Burleigh County to 24.5 percent in Oliver County.

Transportation

Substantial coal development in the study area could result in commuting to the area from other regions of the state. Appendix Table 42 illustrates the count of persons in the major study area by means of transportation to work in 1970. By far the greatest majority of the people drove to work in a privately owned automobile. High gasoline prices and possible long commuting distances to the coal development areas may pose interesting developments with respect to location of residency and means of transportation to work.

Community Infrastructure

Housing

Development of the coal resources could put a significant strain on housing needs in the study area. Appendix Table 43 indicates only 767 housing units in Oliver County. Even a small influx of people to Oliver County would create a relatively large impact on housing. The general housing characteristics for Burleigh, Morton, and Stark counties are shown in Appendix Table 44. An inventory of detailed housing characteristics for the seven county area in 1970 is shown in Appendix Tables 45 and 46.

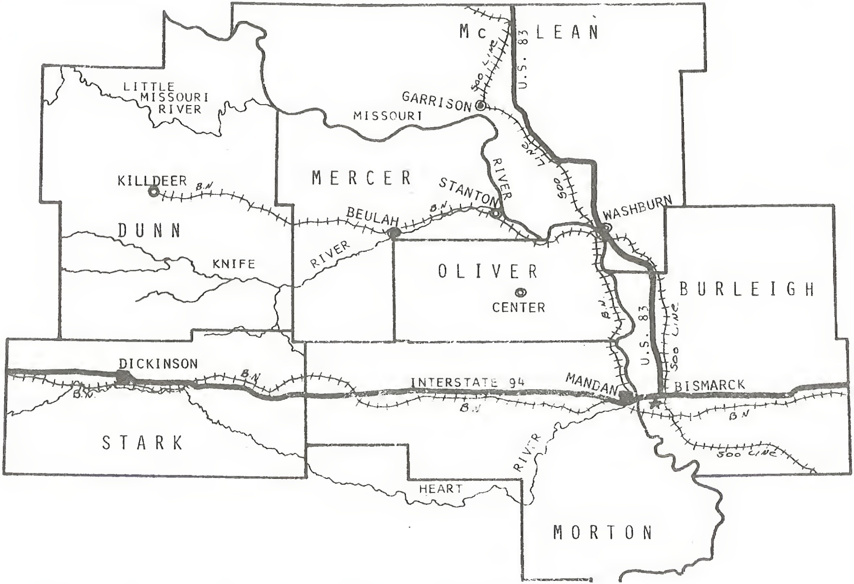
Hospital and Nursing Home Facilities

Appendix Tables 47 and 48 indicate the hospital facilities by county in Regions 7 and 8 of North Dakota. Dunn and Oliver counties do not have a hosiptal. The nursing home facilities by county for Regions 7 and 8 are shown in Tables 49 and 50. Dunn and Oliver counties do not have a nursing home facility.

Water and Sewer Systems

An inventory of the municipal sewage systems by county in Regions 7 and 8 in North Dakota for cities and villages with a 1960 population between 75 and 10,000 population, as of September 15, 1972, is shown in Appendix Tables 51 and 52.

An inventory of the municipal and community water systems by county in North Dakota's Regions 7 and 8 for cities and villages with 1960 populations between 75 to 10,000, as of September 1, 1972, is illustrated in Appendix Tables 53 and 54.



APPENDIX FIGURE 1. MAJOR HIGHWAY SYSTEMS, RAILROAD SYSTEMS, TOWNS, AND RIVERS IN MAJOR COAL IMPACT AREA

APPENDIX TABLE 1. POPULATION CHANGE AND NET MIGRATION TO AND FROM DUNN, MCLEAN, MERCER, AND OLIVER COUNTIES, NORTH DAKOTA, 1960 TO 1970

	POPULATION		POPULATION CHANGE 1960 TO 1970		COMPONENTS OF CHANGE			
COUNTY	1960 NUMBER	1970 NUMBER	NUMBER	RATE[a] PER CENT	BIRTHS TO RESIDENT MOTHERS NUMBER	DEATHS OF RESIDENTS NUMBER	NET MIGRATION NUMBER	RATE OF NET MIGRATION[b] PER CENT
DUNN	6,350	4,895	- 1,455	-22.9	1,141	449	- 2,147	-33.8
MCLEAN	14,030	11,251	- 2,779	-19.8	2,278	1,225	- 3,832	-27.3
MERCER	6,805	6,175	- 630	- 9.3	1,191	581	- 1,240	-18.2
OLIVER	2,610	2,322	- 288	-11.0	442	155	- 575	-22.0
FOUR COUNTY TOTAL	29,795	24,643	- 5,152	-17.0	5,052	2,410	- 7,794	-26.2
STATE TOTAL	632,446	617,761	-14,685	- 2.3	135,293	55,107	-94,871	-15.0

[a] Population change, expressed as a per cent of 1960 population

[b] Net migration, expressed as a per cent of 1960 population. A plus sign (+) indicates net in-migration and a minus (-) sign indicates net out-migration.

Source: U.S. Bureau of the Census, "1970 U.S. Census of Population: Final Population Counts," PC (VI)-36, October 1970; and unpublished tabulations of the Division of Vital Statistics, North Dakota Department of Health.

APPENDIX TABLE 2. POPULATION CHANGE AND NET MIGRATION TO AND FROM BURLEIGH, MORTON, AND STARK COUNTIES, NORTH DAKOTA, 1960 TO 1970

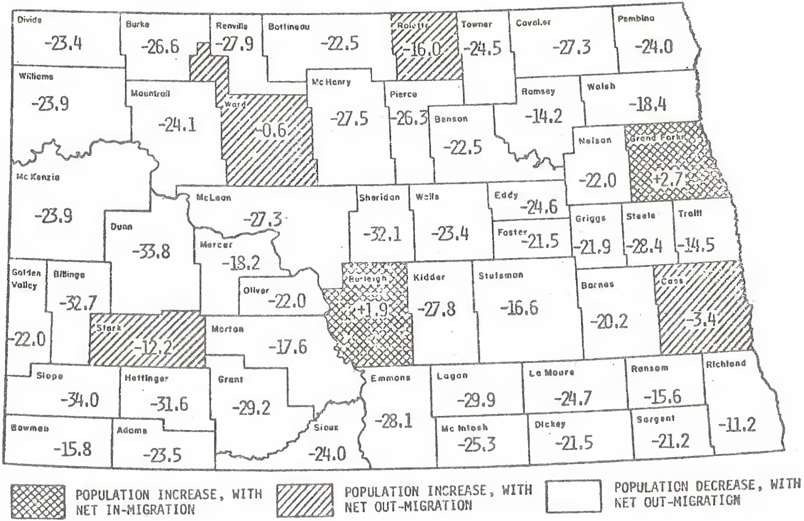
County	Population		Population Change 1960 to 1970		Components of Change			Rate of Net Migration[b]
	1960	1970	Amount	Rate[a]	Births to Resident Mothers	Deaths of Residents	Net Migration	
	NUMBER	*NUMBER*	*NUMBER*	*PERCENT*	*NUMBER*	*NUMBER*	*NUMBER*	*PERCENT*
Burleigh	34,016	40,714	+6,698	+19.7	8,576	2,514	+636	+1.9
Morton	20,992	20,310	-682	-3.2	4,787	1,778	-3,691	-17.6
Stark	18,451	19,613	+1,162	+6.3	4,808	1,402	-2,244	-12.2
State Total	632,446	617,761	-14,685	-2.3	135,293	55,107	-94,871	-15.0

[a] Population change expressed as a percent of 1960 population.

[b] Net migration expressed as a percent of 1960 population. A plus sign (+) indicates net in-migration and a minus sign (-) indicates net out-migration.

SOURCE: U.S. Bureau of the Census, 1970 U.S. Census of Population: Final Population Counts, PC(VI)-36, October, 1970; and unpublished tabulations of the Division of Vital Statistics, North Dakota Department of Health.

APPENDIX FIGURE 2. POPULATION CHANGE AND NET MIGRATION, BY COUNTIES, 1960 TO 1970



FIGURES ARE NET MIGRATION RATES, EXPRESSED AS PERCENTAGE OF 1960 POPULATION.

SOURCE: ADVANCE REPORT, 1970 U.S. CENSUS OF POPULATION AND DIVISION OF VITAL STATISTICS, NORTH DAKOTA DEPARTMENT OF PUBLIC HEALTH.

APPENDIX TABLE 3. COUNT OF PERSONS BY AGE AND SEX, DUNN, MCLEAN, MERCER, OLIVER COUNTIES, AND NORTH DAKOTA STATE TOTAL, 1970

	DUNN		MCLEAN		MERCER		OLIVER		NORTH DAKOTA	
	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
UNDER 3	95	106	219	247	158	134	43	47	15,539	14,870
3 - 4	109	88	241	174	93	105	66	42	10,757	10,166
5	35	67	104	102	49	70	32	5	5,832	6,049
6	66	51	138	110	59	65	33	24	6,733	6,194
7 - 9	141	170	336	342	188	203	73	96	20,360	19,575
10 - 13	323	261	524	551	276	292	136	113	28,461	27,219
14	54	82	170	197	62	40	41	43	7,574	7,038
15	77	40	175	83	78	76	26	25	7,360	6,985
16	71	51	185	104	53	88	24	36	7,107	6,576
17	85	80	145	101	58	57	0	5	6,687	6,538
18	73	23	102	54	37	37	21	34	6,647	6,070
19	33	4	15	63	24	35	10	11	5,741	5,406
20	26	5	14	36	20	11	15	10	5,574	5,446
21	28	45	25	17	14	24	37	7	5,113	4,919
22 - 24	62	82	173	202	97	143	39	58	13,880	13,006
25 - 29	107	134	269	245	194	144	62	59	17,771	16,934
30 - 34	115	114	241	259	135	153	68	45	15,296	15,419
35 - 39	115	112	222	271	207	144	56	45	15,687	15,726
40 - 44	117	74	292	330	129	185	74	74	16,466	16,347
45 - 49	148	149	402	320	258	224	70	73	16,439	15,436
50 - 54	151	165	319	368	204	188	67	82	15,920	15,788
55 - 59	199	130	382	359	171	183	71	51	15,912	15,245
60 - 61	60	58	185	130	83	70	48	25	5,914	5,764
62 - 64	68	41	169	181	79	112	35	26	7,756	8,156
65 - 69	97	33	245	236	130	130	17	12	10,865	10,974
70 - 74	59	67	123	127	70	101	16	9	8,016	9,294
75	53	96	314	313	115	120	49	45	12,144	15,070
TOTAL	2,567	2,328	5,729	5,522	3,041	3,134	1,229	1,102	311,551	306,210
PER CENT	52.4	47.6	50.9	49.1	49.2	50.8	52.7	47.3	50.4	49.6

Source: Ostenson, Thomas K., North Dakota General Population Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue Number Nine, North Dakota Agricultural Experiment Statement, North Dakota State University, April 1972.

APPENDIX TABLE 4. COUNT OF PERSONS BY AGE AND SEX, BURLEIGH, MORTON, STARK COUNTIES, AND NORTH DAKOTA STATE TOTAL, 1970

	Burleigh		Morton		Stark		North Dakota	
	Male	Female	Male	Female	Male	Female	Male	Female
Under 3	1,126	1,097	603	541	545	497	15,539	14,870
3 - 4	799	749	422	374	368	383	10,757	10,166
5	444	525	212	216	203	230	5,832	6,049
6	545	434	282	196	254	217	6,733	6,194
7 - 9	1,382	1,379	737	724	642	624	20,360	19,575
10 - 13	1,825	1,800	1,076	1,012	931	922	28,461	27,219
14	473	411	294	274	228	230	7,574	7,038
15	445	432	317	250	254	255	7,360	6,985
16	419	385	264	248	218	223	7,107	6,576
17	407	434	257	245	254	216	6,687	6,538
18	355	488	185	192	281	394	6,647	6,070
19	303	476	90	87	228	198	5,741	5,406
20	268	378	35	82	206	295	5,574	5,446
21	197	444	47	131	225	209	5,113	4,919
22 - 24	731	1,073	277	375	423	372	13,880	13,006
25 - 29	1,385	1,513	534	469	540	542	17,771	16,934
30 - 34	1,179	1,249	467	501	448	403	15,296	15,419
35 - 39	1,166	1,168	553	621	416	469	15,687	15,726
40 - 44	1,209	1,067	595	575	503	491	16,466	16,347
45 - 49	1,011	1,063	552	550	425	467	16,439	15,436
50 - 54	1,067	908	544	569	486	452	15,920	15,788
55 - 59	730	1,066	477	386	404	449	15,912	15,245
60 - 61	328	308	189	195	131	221	5,914	5,764
62 - 64	391	483	177	236	202	190	7,756	8,156
65 - 69	469	538	396	407	306	359	10,865	10,974
70 - 74	364	532	218	310	166	222	8,016	9,294
75 and Over	488	808	338	406	281	401	12,144	15,070
Total	19,506	21,208	10,138	10,172	9,568	9,931	311,551	306,210
Percent	47.9	52.1	49.9	50.1	49.1	50.9	50.4	49.6

SOURCE: Ostenson, Thomas K., *North Dakota General Population Characteristics by Counties, 1970 Census of Population*, Agricultural Economics Statistical Series, Issue No. 9, North Dakota Agricultural Experiment Station, North Dakota State University, April, 1972.

APPENDIX TABLE 5. COUNT OF PERSONS 16+ IN THE LABOR FORCE BY AGE COHORT, DUNN, MCLEAN, MERCER, OLIVER COUNTIES, AND NORTH DAKOTA STATE TOTAL, 1970

	DUNN		MCLEAN		MERCER		OLIVER		NORTH DAKOTA	
	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
16 - 17	61	12	118	42	65	23	5	0	4,365	3,116
18 - 19	61	4	51	41	51	19	6	21	6,199	5,299
20 - 21	44	30	39	37	30	5	40	17	7,342	5,745
22 - 24	62	34	151	95	82	62	28	19	11,703	6,725
25 - 34	208	61	463	130	309	75	125	24	30,780	11,776
35 - 44	232	68	487	218	326	109	126	16	30,328	12,818
45 - 64	590	159	1,179	457	725	241	259	76	52,795	24,309
65 +	101	10	203	38	74	16	31	0	8,124	3,798
TOTAL	1,359	378	2,691	1,058	1,662	550	620	173	151,636	73,586

Source: Ostenson, Thomas K., North Dakota Employment Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue Number Seven, North Dakota Agricultural Experiment Station, North Dakota State University, April 1972.

APPENDIX TABLE 6. COUNT OF PERSONS 16+ IN THE LABOR FORCE BY AGE COHORT, BURLEIGH, MORTON, STARK COUNTIES, AND NORTH DAKOTA STATE TOTAL, 1970

	Burleigh		Morton		Stark		North Dakota	
	Male	Female	Male	Female	Male	Female	Male	Female
16 - 17	354	247	179	102	206	112	4,365	3,116
18 - 19	420	608	134	141	287	294	6,199	5,299
20 - 21	349	589	68	131	289	272	7,342	5,745
22 - 24	639	634	254	173	334	188	11,703	6,725
25 - 34	2,449	1,219	969	302	915	361	30,780	11,776
35 - 44	2,280	1,153	1,118	494	893	416	30,328	12,818
45 - 64	3,190	2,069	1,730	667	1,405	733	52,795	24,309
65+	392	210	227	106	187	79	8,124	3,798
Total	10,073	6,729	4,679	2,116	4,516	2,455	151,636	73,586

SOURCE: Ostenson, Thomas K., _North Dakota Employment Characteristics by Counties, 1970 Census of Population_, Agricultural Economics Statistical Series, Issue No. 7, North Dakota Agricultural Experiment Station, North Dakota State University, April, 1972.

APPENDIX TABLE 7. POPULATION BY RACE, DUNN, MCLEAN, MERCER, AND OLIVER COUNTIES, NORTH DAKOTA, 1960, 1970 CENSUS

	WHITE		INDIAN		OTHER	
COUNTY	1960	1970	1960	1970	1960	1970
DUNN	5,917	4,490	432	395	1	10
MCLEAN	13,340	10,693	686	541	4	17
MERCER	6,671	6,100	134	72	0	3
OLIVER	2,609	2,309	1	13	0	0
FOUR COUNTY TOTAL	28,537	23,592	1,253	1,021	5	30
STATE TOTAL	619,538	599,485	11,736	14,369	1,172	3,907

Source: U S. Census of Population: 1960, 1970, Number of Inhabitants, North Dakota, (Washington, D C , U.S. Government Printing Office, 1960, 1970).

APPENDIX TABLE 8. COUNT OF PERSONS 25 YEARS OLD AND OVER BY SEX AND YEARS OF SCHOOL COMPLETED, DUNN, MCLEAN, MERCER, OLIVER COUNTIES, AND NORTH DAKOTA STATE TOTAL, 1970

	DUNN				MCLEAN				MERCER				OLIVER				NORTH DAKOTA			
	MALE	FEMALE	TOTAL	PER CENT	MALE	FEMALE	TOTAL	PER CENT	MALE	FEMALE	TOTAL	PER CENT	MALE	FEMALE	TOTAL	PER CENT	MALE	FEMALE	TOTAL	PER PCT.
NO SCHOOL YEARS COMPLETED	3	16	19	.8	8	34	42	.7	26	17	43	1.2	4	9	13	1.1	1585	1610	3195	1.0
ELEMENTARY:																				
1-4 YEARS	47	47	94	3.8	92	94	186	3.0	158	165	323	9.2	34	17	51	4.3	5256	4597	9853	3.1
5-6 YEARS	94	18	112	4.5	166	173	339	5.4	185	205	390	11.1	40	26	66	5.6	7496	6673	14169	4.5
-7 YEARS	90	65	155	6.3	188	145	333	5.3	148	144	292	8.3	50	16	66	5.6	8403	5658	14061	4.4
-8 YEARS	514	410	924	37.5	1208	795	2003	31.8	618	553	1171	33.2	273	218	491	41.6	45985	35735	81720	25.7
TOTAL	745	540	1285	52.2	1654	1207	2861	45.4	1109	1067	2176	61.7	397	277	674	57.2	67140	52663	119803	37.6
HIGH SCHOOL:																				
1-3 YEARS	168	144	312	12.7	320	314	634	10.1	186	153	339	9.6	77	80	157	13.3	17031	18122	35153	11.0
-4 YEARS	246	263	509	20.7	726	852	1578	25.0	302	310	612	17.3	109	113	222	18.8	39146	48660	87806	27.6
TOTAL	414	407	821	33.3	1046	1166	2212	35.1	488	463	951	26.9	186	193	379	32.1	56177	66782	122959	38.6
COLLEGE:																				
1-3 YEARS	58	153	211	8.6	236	587	823	13.1	84	151	235	6.7	35	53	88	7.5	17122	28558	45680	14.3
4 YEARS	47	52	99	4.0	101	129	230	3.6	30	56	86	2.4	11	14	25	2.1	8311	8176	16487	5.2
5+ YEARS	22	5	27	1.1	118	16	134	2.1	38	0	38	1.1	0	0	0	0.0	7851	2364	10215	3.2
TOTAL	127	210	337	13.7	455	732	1187	18.8	152	207	359	10.2	46	67	113	9.6	33284	39098	72382	22.7
TOTAL	1289	1173	2462	100.0	3163	3139	6302	100.0	1775	1754	3529	100.0	633	546	1179	100.0	158186	160153	318339	99.9

* Total percent may not add to 100 due to rounding.

Source: Ostenson, Thomas K., North Dakota Education Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue Number Eight, North Dakota Agricultural Experiment Station, North Dakota State University, April 1972.

APPENDIX TABLE 9. COUNT OF PERSONS 25 YEARS OLD AND OVER BY SEX AND YEARS OF SCHOOL COMPLETED, BURLEIGH, MORTON, STARK COUNTIES, AND NORTH DAKOTA STATE TOTAL, 1970

	Burleigh				Morton				Stark				North Dakota			
	Male	Female	Total	Percent[a]	Male	Female	Total	Percent[a]	Male	Female	Total	Percent[a]	Male	Female	Total	Percent[a]
No School Years Completed	82	72	154	.8	92	118	210	2.0	86	119	205	2.3	1,585	1,610	3,195	1.0
Elementary:																
1-4 Years	263	356	619	3.0	224	297	521	5.1	301	316	617	6.9	5,256	4,597	9,853	3.1
5-6 Years	368	360	728	3.6	363	300	663	6.5	250	259	509	5.7	7,496	6,673	14,169	4.5
7 Years	441	347	788	3.8	328	285	613	6.0	219	224	443	4.9	8,403	5,658	14,061	4.4
8 Years	2,190	1,967	4,157	20.3	1,710	1,538	3,248	31.6	1,241	1,274	2,515	28.0	45,985	35,735	81,720	25.7
Total	3,262	3,030	6,292	30.7	2,625	2,420	5,045	49.1	2,011	2,073	4,084	45.5	67,140	52,663	119,803	37.6
High School:																
1-3 Years	901	912	1,813	8.8	413	457	870	8.5	419	406	825	9.2	17,031	18,122	35,153	11.0
4 Years	2,389	3,474	5,863	28.6	1,084	1,305	2,390	23.3	971	1,088	2,059	22.9	39,146	48,660	87,806	27.6
Total	3,290	4,386	7,676	37.5	1,497	1,763	3,260	31.8	1,390	1,494	2,884	32.1	56,177	66,782	122,959	38.6
College:																
1-3 Years	1,606	2,268	3,874	18.9	436	676	1,112	10.8	397	667	1,064	11.9	17,122	28,558	45,680	14.3
4 Years	888	709	1,597	7.8	210	197	407	4.0	182	224	406	4.5	8,311	8,176	16,487	5.2
5+ Years	659	238	897	4.4	180	51	231	2.3	242	89	331	3.7	7,851	2,364	10,215	3.2
Total	3,153	3,215	6,368	31.1	826	924	1,750	17.0	821	980	1,801	20.1	33,284	39,098	72,382	22.7
Total	9,787	10,703	20,490	100.1	5,040	5,225	10,265	99.9	4,308	4,666	8,974	100.0	158,186	160,153	318,339	99.9

[a] Total percent may not add to 100 due to rounding.

SOURCE: Ostenson, Thomas K., North Dakota Education Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue No. 8, North Dakota Agricultural Experiment Station, North Dakota State University, April, 1972.

APPENDIX TABLE 10. COUNT OF PERSONS 3-34 YEARS OLD ENROLLED IN SCHOOL BY AGE, DUNN, MCLEAN, MERCER, OLIVER COUNTIES, AND NORTH DAKOTA STATE TOTAL, 1970

	DUNN		MCLEAN		MERCER		OLIVER		NORTH DAKOTA	
	COUNT	PERCENT	COUNT	PERCENT	COUNT	PERCENT	COUNT	PERCENT*	COUNT	PERCENT*
3 - 4 YEARS	9	.5	30	.9	6	.4	0	0.0	910	.5
5 - 6 YEARS	113	6.9	297	9.1	104	6.4	20	4.0	14,400	7.5
7 - 13 YEARS	874	53.0	1,691	52.0	960	59.4	289	58.0	92,723	48.1
14 - 15 YEARS	229	13.9	586	18.0	247	15.3	112	22.5	27,776	14.4
16 - 17 YEARS	271	16.4	485	14.9	224	13.9	38	7.6	25,009	13.0
18 - 19 YEARS	106	6.4	142	4.4	65	4.0	39	7.8	16,307	8.5
20 - 21 YEARS	10	.6	0	0.0	9	.6	0	0.0	8,092	4.2
22 - 24 YEARS	19	1.2	19	.6	0	0.0	0	0.0	4,137	2.1
25 - 34 YEARS	18	1.1	4	.1	0	0.0	0	0.0	3,504	1.8
TOTAL	1,649	100.0	3,254	100.0	1,615	100.0	498	99.9	192,858	100.1

* Total percent may not total 100 due to rounding.

Source: Ostenson, Thomas K., North Dakota Education Characteristics By Counties, 1970 Census Of Population, Agricultural Economics Statistical Series, Issue Number Eight, North Dakota Agricultural Experiment Station, North Dakota State University, April 1972.

APPENDIX TABLE 11. COUNT OF PERSONS 3 TO 34 YEARS OLD ENROLLED IN SCHOOL BY AGE, BURLEIGH, MORTON, STARK COUNTIES, AND NORTH DAKOTA STATE TOTAL, 1970

	Burleigh		Morton		Stark		North Dakota	
Years	Count	Percent[a]	Count	Percent[a]	Count	Percent[a]	Count	Percent[a]
3 - 4	39	.3	5	.1	14	.2	910	.5
5 - 6	1,027	8.6	411	6.6	382	5.5	14,400	7.5
7 - 13	6,024	50.4	3,431	54.7	3,075	44.0	92,723	48.1
14 - 15	1,685	14.1	1,015	16.2	898	12.8	27,776	14.4
16 - 17	1,482	12.4	922	14.7	849	12.1	25,009	13.0
18 - 19	1,091	9.1	310	4.9	891	12.7	16,307	8.5
20 - 21	253	2.1	36	.6	559	8.0	8,092	4.2
22 - 24	156	1.3	54	.9	162	2.3	4,137	2.1
25 - 34	193	1.6	87	1.4	166	2.4	3,504	1.8
Total	11,950	99.9	6,271	100.1	6,996	100.0	192,858	100.1

[a] Total percent may not total 100 due to rounding.

SOURCE: Ostenson, Thomas K., North Dakota Education Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue No. 8, North Dakota Agricultural Experiment Station, North Dakota State University, April, 1972.

APPENDIX TABLE 12. COUNT OF PERSONS 16-64 YEARS OLD WITH LESS THAN 3 YEARS OF COLLEGE COMPLETED BY SEX AND BY VOCATIONAL TRAINING, DUNN, MCLEAN, MERCER, OLIVER COUNTIES, AND NORTH DAKOTA STATE TOTAL, 1970

	DUNN		MCLEAN		MERCER		OLIVER		NORTH DAKOTA	
	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
WITH VOCATIONAL TRAINING	330	131	739	344	427	161	192	41	37,134	24,383
WITHOUT VOCATIONAL TRAINING	954	985	2,268	2,491	1,111	1,591	500	573	117,740	130,240
TOTAL	1,284	1,116	3,007	2,835	1,538	1,752	692	614	154,874	154,623

Source: Ostenson, Thomas K., North Dakota Education Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue Number Eight, North Dakota Agricultural Experiment Station, North Dakota State University, April 1972.

APPENDIX TABLE 13. COUNT OF PERSONS 16 TO 64 YEARS OLD WITH LESS THAN THREE YEARS OF COLLEGE COMPLETED BY SEX AND BY VOCATIONAL TRAINING, BURLEIGH, MORTON, STARK COUNTIES, AND NORTH DAKOTA STATE TOTAL, 1970

	Burleigh		Morton		Stark		North Dakota	
	Male	Female	Male	Female	Male	Female	Male	Female
With Vocational Training	2,632	1,570	1,212	501	835	527	37,134	24,383
Without Vocational Training	6,631	9,419	3,854	4,630	3,818	4,492	117,740	130,240
Total	9,263	10,989	5,066	5,131	4,653	5,019	154,874	154,623

SOURCE: Ostenson, Thomas K., North Dakota Education Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue No. 8, North Dakota Agricultural Experiment Station, North Dakota State University, April, 1972.

APPENDIX TABLE 14. COUNT OF FAMILIES BY FAMILY INCOME, DUNN, MCLEAN, MERCER, OLIVER COUNTIES, AND NORTH DAKOTA STATE TOTAL, 1970

	DUNN		MCLEAN		MERCER		OLIVER		NORTH DAKOTA	
FAMILY INCOME	COUNT	PERCENT*	COUNT	PERCENT*	COUNT	PERCENT*	COUNT	PERCENT*	COUNT	PERCENT*
UNDER $1,000	72	6.4	116	4.1	45	2.8	12	2.0	3,540	2.4
$1,000-$1,999	48	4.2	197	6.9	94	5.8	38	6.4	6,076	4.1
$2,000-$2,999	89	7.9	153	5.3	167	10.3	60	10.1	8,240	5.6
$3,000-$3,999	91	8.0	273	9.5	123	7.6	37	6.2	10,216	6.9
$4,000-$4,999	105	9.3	218	7.6	179	11.0	72	12.1	10,995	7.4
$5,000-$5,999	105	9.3	226	7.9	118	7.2	52	8.7	12,564	8.5
$6,000-$6,999	93	8.2	214	7.5	124	7.6	51	8.5	12,490	8.4
$7,000-$7,999	106	9.4	326	11.4	120	7.4	65	10.9	11,922	8.0
$8,000-$8,999	84	7.4	195	6.8	135	8.3	34	5.7	11,743	7.9
$9,000-$9,999	64	5.7	202	7.1	102	6.3	12	2.0	9,672	6.5
$10,000-$11,999	81	7.2	330	11.5	180	11.0	66	11.1	17,309	11.7
$12,000-$14,999	68	6.0	184	6.4	127	7.8	54	9.0	14,443	9.7
$15,000-$24,999	74	6.5	167	5.8	95	5.8	44	7.4	14,629	9.9
$25,000-$49,999	41	3.6	44	1.5	16	1.0	0	0.0	3,765	2.5
$50,000 And Over	11	1.0	18	.6	4	.2	0	0.0	631	.4
TOTAL	1,132	100.1	2,863	99.9	1,629	100.1	597	100.1	148,235	99.9
MEDIAN RANGE	$6,000 - $6,999		$7,000 - $7,999		$6,000 - $6,999		$6,000 - $6,999		$7,000 - $7,999	
AVERAGE FAMILY INCOME	$8,389		$7,911		$7,545		$7,287		$9,085	

* Total percent may not total 100 due to rounding error

Source: Ostenson, Thomas K., North Dakota Income Characteristics By Counties, 1970 Census Of Population, Agricultural Economics Statistical Series, Issue Number Six, North Dakota Agricultural Experiment Station, North Dakota State University, April 1972

APPENDIX TABLE 15. COUNT OF FAMILIES BY FAMILY INCOME, BURLEIGH, MORTON, STARK COUNTIES, AND NORTH DAKOTA STATE TOTAL, 1970

Family Income	Burleigh		Morton		Stark		North Dakota	
	Count	Percent[a]	Count	Percent[a]	Count	Percent[a]	Count	Percent[a]
Under $1,000	252	2.6	90	1.9	159	3.7	3,540	2.4
$1,000 - $1,999	275	2.8	185	3.8	190	4.5	6,076	4.1
$2,000 - $2,999	313	3.2	311	6.5	226	5.3	8,240	5.6
$3,000 - $3,999	459	4.7	421	8.8	321	7.6	10,216	6.9
$4,000 - $4,999	412	4.2	279	5.8	304	7.2	10,995	7.4
$5,000 - $5,999	678	6.9	478	9.9	360	8.5	12,564	8.5
$6,000 - $6,999	726	7.4	472	9.8	426	10.0	12,490	8.4
$7,000 - $7,999	740	7.5	399	8.3	372	8.8	11,922	8.0
$8,000 - $8,999	763	7.8	363	7.6	361	8.5	11,743	7.9
$9,000 - $9,999	780	7.9	391	8.1	271	6.4	9,672	6.5
$10,000 - $11,999	1,458	14.9	610	12.7	437	10.3	17,309	11.7
$12,000 - $14,999	1,328	13.5	421	8.8	359	8.5	14,443	9.7
$15,000 - $24,999	1,253	12.8	351	7.3	359	8.5	14,629	9.9
$25,000 - $49,999	343	3.5	36	.7	97	2.3	3,765	2.5
$50,000 and Over	36	.4	0	0.0	5	.1	631	.4
Total	9,816	100.1	4,807	100.0	4,247	100.2	148,235	99.9
Median Range	$ 9,000 -	$9,999	$7,000 -	$7,999	$7,000 -	$7,999	$7,000 -	$7,999
Average Family Income	$10,291		$8,053		$8,464		$9,085	

[a] Total percent may not total 100 due to rounding error.

SOURCE: Ostenson, Thomas K., North Dakota Income Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue No. 6, North Dakota Agricultural Experiment Station, North Dakota State University, April, 1972.

APPENDIX TABLE 16. COUNT AND PERCENTAGE OF MALES 16+ YEARS OLD IN THE EXPERIENCED CIVILIAN LABOR FORCE BY EARNINGS AND OCCUPATION, MERCER COUNTY, NORTH DAKOTA, 1970

	TOTAL EXPERIENCED CIVILIAN LABOR FORCE	PER CENT*	PROFESSIONAL MANAGERIAL	PER CENT*	CRAFTSMEN FOREMEN	PER CENT*	OPERATIVES INCLUDING TRANSPORT	PER CENT	LABORERS EXCEPT FARM	PER CENT*	FARMERS AND FARM MANAGERS	PER CENT	FARM LABORERS	PER CENT
NONE	35	2.1	5	2.5	0	0.0	5	2.9	3	2.0	0	0.0	0	0.0
$1-$999	139	8.4	6	3.0	12	3.6	7	4.1	20	13.1	41	7.4	18	33.3
$1,000-$1,999	132	7.9	0	0.0	14	4.3	0	0.0	9	5.9	79	14.2	18	33.3
$2,000-$2,999	138	8.3	15	7.4	0	0.0	0	0.0	10	6.5	92	16.6	5	9.3
$3,000-$3,999	107	6.4	5	2.5	24	7.3	6	3.5	18	11.8	51	9.2	3	5.6
$4,000-$4,999	176	10.6	11	5.4	36	10.9	6	3.5	24	15.7	84	15.1	6	11.1
$5,000-$5,999	206	12.4	27	13.3	34	10.3	39	22.8	12	7.8	65	11.7	4	7.4
$6,000-$6,999	118	7.1	19	9.4	40	12.2	12	7.0	15	9.8	20	3.6	0	0.0
$7,000-$7,999	181	10.9	36	17.7	46	14.0	35	20.5	16	10.5	21	3.8	0	0.0
$8,000-$8,999	158	9.5	25	12.3	45	13.7	35	20.5	5	3.3	30	5.4	0	0.0
$9,000-$9,999	82	4.9	5	2.5	30	9.1	9	5.3	11	7.2	22	4.0	0	0.0
$10,000-$14,999	143	8.6	28	13.8	37	11.2	17	9.9	5	3.3	40	7.2	0	0.0
$15,000-$24,999	38	2.3	17	8.4	11	3.3	0	0.0	0	0.0	10	1.8	0	0.0
$25,000-OVER	9	.5	4	2.0	0	0.0	0	0.0	5	3.3	0	0.0	0	0.0
TOTAL	1,662	99.9	203	100.2	329	99.9	171	100.0	153	100.2	555	100.0	54	100.0

* Total percent may not total 100 due to rounding.

Source: Ostenson, Thomas K., North Dakota Income Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue Number Six, North Dakota Agricultural Experiment Station, North Dakota State University, April 1972.

APPENDIX TABLE 17. COUNT AND PERCENTAGE OF MALES 16+ YEARS OLD IN THE EXPERIENCED CIVILIAN LABOR FORCE BY EARNINGS AND OCCUPATION, OLIVER COUNTY, NORTH DAKOTA, 1970

	TOTAL EXPERIENCED LABOR FORCE	PERCENT	PROFFESSIONAL MANAGERIAL	PERCENT	CRAFTSMEN FOREMEN	PERCENT*	OPERATIVES INCLUDING TRANSPORT	PERCENT	LABORERS EXCEPT FARM	PERCENT*	FARMERS AND FARM MANAGERS	PER CENT	FARM LABORERS	PER CENT
NONE	14	2.3	0	0.0	0	0.0	0	0.0	0	0.0	14	3.3	0	0.0
$1-$999	58	9.4	0	0.0	0	0.0	0	0.0	0	0.0	44	10.4	10	25.6
$1,000-$1,999	51	8.2	0	0.0	0	0.0	0	0.0	3	13.0	48	11.3	0	0.0
$2,000-$2,999	73	11.8	4	20.0	0	0.0	0	0.0	11	47.8	42	9.9	16	41.0
$3,000-$3,999	77	12.4	0	0.0	7	8.4	0	0.0	0	0.0	61	14.4	4	10.3
$4,000-$4,999	74	11.9	0	0.0	7	8.4	0	0.0	0	0.0	62	14.6	0	0.0
$5,000-$5,999	54	8.7	0	0.0	0	0.0	0	0.0	9	39.1	45	10.6	0	0.0
$6,000-$6,999	39	6.3	5	25.0	8	9.6	0	0.0	0	0.0	26	6.1	0	0.0
$7,000-$7,999	43	6.9	0	0.0	5	6.0	0	0.0	0	0.0	38	8.9	0	0.0
$8,000-$8,999	11	1.8	0	0.0	11	13.0	0	0.0	0	0.0	0	0.0	0	0.0
$9,000-$9,999	15	2.4	0	0.0	5	6.0	0	0.0	0	0.0	5	1.2	5	12.8
$10,000 - $14,999	92	14.8	0	0.0	40	48.2	11	100.0	0	0.0	32	7.5	4	10.3
$15,000- $24,999	19	3.1	11	55.0	0	0.0	0	0.0	0	0.0	8	1.9	0	0.0
$25,000- OVER	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
TOTAL	620	100.0	20	100.0	83	99.9	11	100.0	23	99.9	425	100.1	39	100.0

* Total percent may not total 100 due to rounding.

Source: Ostenson, Thomas K., North Dakota Income Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue Number Six, North Dakota Agricultural Experiment Station, North Dakota State University, April 1972.

APPENDIX TABLE 18. COUNT AND PERCENTAGE OF MALES 16+ YEARS OLD IN THE EXPERIENCED CIVILIAN LABOR FORCE BY EARNINGS AND OCCUPATION, MCLEAN COUNTY, NORTH DAKOTA, 1970

	TOTAL EXPERIENCED CIVILIAN LABOR FORCE	PER CENT	PROFESSIONAL MANAGERIAL	PER CENT*	CRAFTSMEN FOREMEN	PER CENT*	OPERATIVES INCLUDING TRANSPORT	PER CENT*	LABORERS EXCEPT FARM	PER CENT*	FARMERS AND FARM MANAGERS	PER CENT*	FARM LABORERS	PER CENT*
NONE	49	1.8	0	0.0	11	2.7	0	0.0	0	0.0	0	0.0	0	0.0
$1-$999	270	10.1	33	7.2	5	1.2	15	7.5	23	27.4	76	7.4	70	46.7
$1,000-$1,999	189	7.0	11	2.4	13	3.2	37	18.6	11	13.1	80	7.8	8	5.3
$2,000-$2,999	211	7.9	11	2.4	15	3.7	22	11.1	4	4.8	111	10.9	22	14.7
$3,000-$3,999	221	8.2	26	5.7	21	5.1	18	9.0	10	11.9	113	11.0	19	12.7
$4,000-$4,999	297	11.1	47	10.3	48	11.7	16	8.0	10	11.9	130	12.7	6	4.0
$5,000-$5,999	299	11.2	34	7.4	53	12.9	30	15.1	0	0.0	135	13.2	10	6.7
$6,000-$6,999	230	8.6	39	8.5	73	17.8	20	10.1	4	4.8	69	6.7	0	0.0
$7,000-$7,999	210	7.8	25	5.5	46	11.2	15	7.5	12	14.3	76	7.4	12	8.0
$8,000-$8,999	170	6.3	31	6.8	46	11.2	5	2.5	5	6.0	56	5.5	3	2.0
$9,000-$9,999	106	4.0	38	8.3	9	2.2	0	0.0	5	6.0	25	2.4	0	0.0
$10,000-$14,999	326	12.2	123	26.9	60	14.6	17	8.5	0	0.0	102	10.0	0	0.0
$15,000-$24,999	87	3.2	23	5.0	10	2.4	4	2.0	0	0.0	50	4.9	0	0.0
$25,000-OVER	16	.6	16	3.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
TOTAL	2,681	100.0	457	99.9	410	99.9	199	99.9	84	100.2	1,023	99.9	150	100.1

* Total percent may not total 100 due to rounding.

Source: Ostenson, Thomas K., North Dakota Income Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue Number Six, North Dakota Agricultural Experiment Station, North Dakota State University, April 1972.

APPENDIX TABLE 19. COUNT AND PERCENTACE OF MALES 16+ YEARS OLD IN THE EXPERIENCED CIVILIAN LABOR FORCE BY EARNINGS AND OCCUPATION, DUNN COUNTY, NORTH DAKOTA, 1970

	TOTAL EXPERIENCED CIVILIAN LABOR FORCE	PER CENT*	PROFESSIONAL MANAGERIAL	PER CENT*	CRAFTSMEN FOREMEN	PER CENT*	OPERATIONS INCLUDINC TRANSPORT	PER CENT*	LABORERS EXCEPT FARM	PER CENT*	FARMERS AND FARM MANAGERS	PER CENT*	FARM LABORERS	PER CENT
NONE	66	4.9	0	0.0	0	0.0	0	0.0	0	0.0	3	.4	5	5.9
$1-$999	169	12.4	0	0.0	10	9.6	11	18.6	5	18.5	98	13.3	16	18.8
$1,000-$1,999	123	9.1	4	2.9	0	0.0	0	0.0	8	29.6	61	8.3	23	27.1
$2,000-$2,999	189	13.9	6	4.3	15	14.4	15	25.4	0	0.0	113	15.3	22	25.9
$3,000-$3,999	121	8.9	24	17.1	12	11.5	0	0.0	10	37.0	52	7.1	10	11.8
$4,000-$4,999	143	10.5	15	10.7	14	13.5	8	13.6	4	14.8	92	12.5	0	0.0
$5,000-$5,999	152	11.2	13	9.3	31	29.8	4	6.8	0	0.0	90	12.2	5	5.9
$6,000-$6,999	87	6.4	12	8.6	4	3.8	5	8.5	0	0.0	58	7.9	4	4.7
$7,000-$7,999	61	4.5	15	10.7	4	3.8	5	8.5	0	0.0	27	3.7	0	0.0
$8,000-$8,999	55	4.0	11	7.9	5	4.8	6	10.2	0	0.0	18	2.4	0	0.0
$9,000-$9,999	47	3.5	12	8.6	4	3.8	0	0.0	0	0.0	31	4.2	0	0.0
$10,000-$14,999	84	6.2	19	13.6	5	4.8	5	8.5	0	0.0	41	5.6	0	0.0
$15,000-$24,999	32	2.4	9	6.4	0	0.0	0	0.0	0	0.0	23	3.1	0	0.0
$25,000-OVER	30	2.2	0	0.0	0	0.0	0	0.0	0	0.0	30	4.1	0	0.0
TOTAL	1,359	100.1	140	100.1	104	99.8	59	100.1	27	99.9	737	100.1	85	100.1

* Total percent may not total 100 due to rounding.

Source: Ostenson, Thomas K., North Dakota Income Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue Number Six, North Dakota Agricultural Experiment Station, North Dakota State University, April 1972.

APPENDIX TABLE 20. COUNT AND PERCENTAGE OF MALES 16+ YEARS OLD IN THE EXPERIENCED CIVILIAN LABOR FORCE BY EARNINGS AND OCCUPATION, BURLEIGH COUNTY, NORTH DAKOTA, 1970

	Burleigh													
	Total Experienced Civilian Labor Force	Percent[a]	Professional, Managerial	Percent[a]	Craftsmen, Foremen	Percent[a]	Operatives, Including Transport	Percent[a]	Laborers, Except Farm	Percent[a]	Farmers and Farm Managers	Percent[a]	Farm Laborers	Percent[a]
None	134	1.3	15	.4	20	1.1	32	3.2	9	1.9	5	.7	0	0.0
$1-$999	573	5.7	63	1.8	26	1.4	95	9.6	57	11.9	81	11.6	25	12.8
$1,000-$1,999	545	5.5	55	1.6	90	4.8	90	9.1	68	14.2	53	7.6	29	14.8
$2,000-$2,999	526	5.3	112	3.2	86	4.5	47	4.8	56	11.7	107	15.3	5	2.6
$3,000-$3,999	525	5.3	61	1.8	68	3.6	94	9.5	52	10.9	116	16.5	21	10.7
$4,000-$4,999	642	6.4	118	3.4	120	6.3	128	13.0	26	5.4	40	5.7	34	17.3
$5,000-$5,999	873	8.8	169	4.9	256	13.5	145	14.7	60	12.5	68	9.7	14	7.1
$6,000-$6,999	1,003	10.1	310	9.0	179	9.5	67	6.8	79	16.5	45	6.4	4	2.0
$7,000-$7,999	930	9.3	307	8.9	283	15.0	91	9.2	26	5.4	14	2.0	4	2.0
$8,000-$8,999	940	9.4	337	9.7	278	14.7	51	5.2	15	3.1	48	6.8	15	7.7
$9,000-$9,999	737	7.4	343	9.9	159	8.4	83	8.4	10	2.1	33	4.7	10	5.1
$10,000-$14,999	1,694	17.0	949	27.4	275	14.5	60	6.1	16	3.3	61	8.7	30	15.3
$15,000-$24,999	617	6.2	453	13.1	47	2.5	5	.5	0	0.0	17	2.4	0	0.0
$25,000 and Over	237	2.4	168	4.9	4	.2	0	0.0	5	1.0	13	1.9	5	2.6
Total	9,976	100.1	3,460	100.0	1,891	100.0	988	100.1	479	99.9	701	100.0	196	100.0

[a] Total percent may not total 100 due to rounding.

SOURCE: Ostenson, Thomas K., North Dakota Income Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue No. 6, North Dakota Agricultural Experiment Station, North Dakota State University, April, 1972.

APPENDIX TABLE 21. COUNT AND PERCENTAGE OF MALES 16+ YEARS OLD IN THE EXPERIENCED CIVILIAN LABOR FORCE BY EARNINGS AND OCCUPATION, MORTON COUNTY, NORTH DAKOTA, 1970

	MORTON													
	Total Experienced Civilian Labor Force	Percent	Professional Managerial	Percent*	Craftsmen Foremen	Percent	Operatives Including Transport	Percent	Laborers Except Farm	Percent	Farmers and Farm Managers	Percent	Farm Laborers	Percent
None	94	2.0	5	.5	10	1.1	10	1.6	19	7.6	4	.5	5	2.6
$1-$999	331	7.1	21	2.2	24	2.6	38	6.1	44	17.6	41	5.2	49	25.7
$1,000-$1,999	300	6.4	26	2.7	49	5.2	31	5.0	12	4.8	53	6.7	32	16.8
$2,000-$2,999	229	4.9	10	1.0	43	4.6	16	2.6	16	6.4	88	11.2	5	2.6
$3,000-$3,999	348	7.5	38	3.9	44	4.7	45	7.2	27	10.8	106	13.5	40	20.9
$4,000-$4,999	388	8.3	52	5.3	39	4.1	104	16.7	21	8.4	69	8.8	10	5.2
$5,000-$5,999	550	11.8	52	5.3	115	12.2	89	14.3	33	13.2	105	13.3	4	2.1
$6,000-$6,999	511	11.0	116	11.9	101	10.7	60	9.6	36	14.4	67	8.5	4	2.1
$7,000-$7,999	450	9.7	112	11.5	131	13.9	83	13.3	26	10.4	39	5.0	19	9.9
$8,000-$8,999	327	7.0	65	6.7	137	14.6	34	5.4	11	4.4	19	2.4	8	4.2
$9,000-$9,999	300	6.4	97	10.0	108	11.5	40	6.4	5	2.0	33	4.2	0	0.0
$10,000-$14,999	613	13.2	258	26.5	118	12.6	70	11.2	0	0.0	100	12.7	15	7.9
$15,000-$24,999	192	4.1	107	11.0	21	2.2	4	.6	0	0.0	51	6.5	0	0.0
$25,000-Over	26	.6	14	1.4	0	0.0	0	0.0	0	0.0	12	1.5	0	0.0
TOTAL	4,659	100.6	973	99.9	940	100.0	624	100.0	250	100.0	787	100.0	191	100.0

*Total percent may not toal 100 due to rounding.

SOURCE: Ostenson, Thomas K., North Dakota Income Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistics Series, Issue Number Six, North Dakota Agricultural Experiment Station, North Dakota State University, April, 1972.

APPENDIX TABLE 22. COUNT AND PERCENTAGE OF MALES 16+ YEARS OLD IN THE EXPERIENCED CIVILIAN LABOR FORCE BY EARNINGS AND OCCUPATION, STARK COUNTY, NORTH DAKOTA, 1970

	STARK													
	Tot. Experienced Civilian Labor Force	Percent*	Professional Managerial	Percent	Craftsmen Foremen	Percent*	Operatives Including Transport	Percent*	Laborers Except Farm	Percent*	Farmers and Farm Managers	Percent	Farm Laborers	Percent
None	180	4.0	4	.4	15	2.1	10	1.9	10	3.7	15	1.9	0	0.0
$1-$999	500	11.1	53	5.1	21	2.9	34	6.4	45	16.7	129	16.2	52	41.9
$1,000-$1,999	384	8.5	56	5.3	40	5.5	45	8.5	32	11.9	95	11.9	31	25.0
$2,000-$2,999	362	8.0	53	5.1	45	6.2	25	4.7	60	22.3	79	9.9	27	21.8
$3,000-$3,999	293	6.5	34	3.2	33	4.6	47	8.9	16	5.9	99	12.5	0	0.0
$4,000-$4,999	375	8.3	25	2.4	85	11.8	67	12.7	16	5.9	107	13.5	14	11.3
$5,000-$5,999	457	10.1	76	7.3	94	13.0	91	17.2	47	17.5	72	9.1	0	0.0
$6,000-$6,999	462	10.2	117	11.2	120	16.6	57	10.8	25	9.3	61	7.7	0	0.0
$7,000-$7,999	336	7.4	72	6.9	83	11.5	58	11.0	9	3.3	25	3.1	0	0.0
$8,000-$8,999	276	6.1	113	10.8	62	8.6	11	2.1	9	3.3	25	3.1	0	0.0
$9,000-$9,999	169	3.7	60	5.7	47	6.5	22	4.2	0	0.0	20	2.5	0	0.0
$10,000-$14,999	507	11.2	235	22.4	65	9.0	57	10.8	0	0.0	41	5.2	0	0.0
$15,000-$24,999	171	3.8	113	10.8	7	1.0	5	.9	0	0.0	27	3.4	0	0.0
$25,000-Over	40	.9	36	3.4	4	.6	0	0.0	0	0.0	0	0.0	0	0.0
TOTAL	4,512	99.8	1,047	100.0	721	99.9	529	100.1	269	99.8	795	100.0	124	100.0

*Total percent may not total 100 due to rounding.

SOURCE: Ostenson, Thomas K., North Dakota Income Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistics Series, Issue Number Six, North Dakota Agricultural Experiment Station, North Dakota State University, April, 1972.

APPENDIX TABLE 23. COUNT AND PERCENTAGE OF MALES 16+ YEARS OLD IN THE EXPERIENCED CIVILIAN LABOR FORCE BY EARNINGS AND OCCUPATION, NORTH DAKOTA, 1970

	TOTAL EXPERIENCED CIVILIAN LABOR FORCE	PER CENT*	PROFESSIONAL MANAGERIAL	PER CENT*	CRAFTSMEN FOREMEN	PER CENT*	OPERATIONS INCLUDING TRANSPORT	PER CENT*	LABORERS EXCEPT FARM	PER CENT*	FARMERS AND FARM MANAGERS	PER CENT*	FARM LABORERS	PER CENT
NONE	2,606	1.9	249	.8	204	.9	288	1.9	180	2.8	196	.6	163	2.7
$1-$999	11,067	7.9	875	2.8	844	3.9	1,058	7.1	1,120	17.6	2,516	7.3	1,665	27.2
$1,000-$1,999	10,843	7.7	1,202	3.8	1,107	5.1	1,284	8.6	936	14.7	2,614	7.6	1,148	18.8
$2,000-$2,999	9,941	7.1	1,103	3.5	1,006	4.6	1,059	7.1	627	9.9	3,816	11.1	792	12.9
$3,000-$3,999	10,120	7.2	1,130	3.6	1,277	5.9	1,394	9.3	568	8.9	3,687	10.7	676	11.0
$4,000-$4,999	11,251	8.0	1,312	4.2	1,925	8.9	1,523	10.2	600	9.4	3,453	10.0	516	8.4
$5,000-$5,999	13,587	9.7	1,804	5.7	2,649	12.2	1,858	12.4	684	10.8	4,004	11.6	326	5.3
$6,000-$6,999	12,935	9.2	2,829	9.0	2,748	12.7	1,541	10.3	636	10.0	2,542	7.4	219	3.6
$7,000-$7,999	12,007	8.5	2,999	9.5	2,703	12.5	1,395	9.3	385	6.1	2,051	6.0	184	3.0
$8,000-$8,999	10,264	7.3	2,823	9.0	2,246	10.4	1,102	7.3	286	4.5	1,781	5.2	66	1.1
$9,000-$9,999	7,036	5.0	2,451	7.8	1,543	7.1	675	4.5	129	2.0	1,025	3.0	65	1.1
$10,000-$14,999	18,721	13.3	7,808	24.8	2,830	13.1	1,424	9.5	145	2.3	3,608	10.5	211	3.4
$15,000-$24,999	7,446	5.3	3,485	11.1	498	2.3	321	2.1	41	.6	2,142	6.2	72	1.2
$25,000-OVER	2,865	2.0	1,437	4.6	101	.5	73	.5	21	.3	997	2.9	18	.3
TOTAL	140,689	100.1	31,507	100.2	21,681	100.1	14,995	100.1	6,358	99.9	34,432	100.1	6,121	100.0

* Total percent may not total 100 due to rounding.

Source: Ostenson, Thomas K., North Dakota Income Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue Number Six, North Dakota Agricultural Experiment Station, North Dakota State University, April 1972.

APPENDIX TABLE 24. COUNT AND PERCENT OF FEMALES 16+ YEARS OLD IN THE EXPERIENCED CIVILIAN LABOR FORCE BY EARNINGS AND OCCUPATION, MERCER AND OLIVER COUNTIES, NORTH DAKOTA, 1970

	MERCER						OLIVER					
	TOTAL CIVILIAN LABOR	PER CENT	CLERICAL KINDRED	PER CENT	OPERATIVES INCLUDING TRANSPORT	PER CENT	TOTAL CIVILIAN LABOR	PER CENT*	CLERICAL KINDRED	PER CENT*	OPERATIVES INCLUDING TRANSPORTATION	PER CENT
NONE	52	9.5	4	3.3	0	0.0	24	13.9	10	21.7	0	0.0
$1-$999	126	22.9	19	15.8	0	0.0	50	28.9	11	23.9	0	0.0
$1,000-$1,999	54	9.8	14	11.7	4	44.4	22	12.7	9	19.6	0	0.0
$2,000-$2,999	129	23.5	31	25.8	5	55.6	24	13.9	6	13.0	0	0.0
$3,000-$3,999	76	13.8	47	39.2	0	0.0	10	5.8	10	21.7	0	0.0
$4,000-$4,999	28	5.1	5	4.2	0	0.0	27	15.6	0	0.0	0	0.0
$5,000-$5,999	44	8.0	0	0.0	0	0.0	6	3.5	0	0.0	0	0.0
$6,000-$6,999	0	0.0	0	0.0	0	0.0	4	2.3	0	0.0	0	0.0
$7,000-$7,999	16	2.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
$8,000-$8,999	9	1.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
$9,000-$9,999	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
$10,000-$14,999	16	2.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
$15,000-OVER	0	0.0	0	0.0	0	0.0	6	3.5	0	0.0	0	0.0
TOTAL	550	100.0	120	100.0	9	100.0	173	100.1	46	99.9	0	0.0

* Total percent may not total 100 due to rounding.

Source: Ostenson, Thomas K., North Dakota Income Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue Number Six, North Dakota Agricultural Experiment Station, North Dakota State University, April 1972.

APPENDIX TABLE 25. COUNT AND PERCENT OF FEMALES 16+ YEARS OLD IN THE EXPERIENCED CIVILIAN LABOR FORCE BY EARNINGS AND OCCUPATION, DUNN AND MCLEAN COUNTIES, NORTH DAKOTA, 1970

	DUNN						MCLEAN					
EARNINGS	TOTAL CIVILIAN LABOR	PER CENT*	CLERICAL KINDRED	PER CENT*	OPERATIVES INCLUDING TRANSPORTATION	PER CENT	TOTAL CIVILIAN LABOR	PER CENT	CLERICAL KINDRED	PER CENT*	OPERATIVES INCLUDING TRANSPORTATION	PER CENT
NONE	52	13.9	0	0.0	0	0.0	145	13.7	31	12.6	5	33.3
$1-$999	54	14.4	11	13.4	0	0.0	249	23.5	53	21.5	10	66.7
$1,000-$1,999	73	19.5	21	25.6	0	0.0	164	15.5	36	14.6	0	0.0
$2,000-$2,999	75	20.1	9	11.0	0	0.0	150	14.2	49	19.9	0	0.0
$3,000-$3,999	33	8.8	18	22.0	0	0.0	121	11.4	42	17.1	0	0.0
$4,000-$4,999	28	7.5	18	22.0	0	0.0	67	6.3	18	7.3	0	0.0
$5,000-$5,999	18	4.8	0	0.0	0	0.0	69	6.5	13	5.3	0	0.0
$6,000-$6,999	20	5.3	5	6.1	0	0.0	29	2.7	4	1.6	0	0.0
$7,000-$7,999	8	2.1	0	0.0	0	0.0	23	2.2	0	0.0	0	0.0
$8,000-$8,999	5	1.3	0	0.0	0	0.0	9	.9	0	0.0	0	0.0
$9,000-$9,999	0	0.0	0.	0.0	0	0.0	3	.3	0	0.0	0	0.0
$10,000-$14,999	8	2.1	0	0.0	0	0.0	6	.6	0	0.0	0	0.0
$15,000-OVER	0	0.0	0	0.0	0	0.0	23	2.2	0	0.0	0	0.0
TOTAL	374	99.8	82	100.1	0	0.0	1,058	100.0	246	99.9	15	100.0

* Total percent may not total 100 due to rounding.

Source: Ostenson, Thomas K., North Dakota Income Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue Number Six, North Dakota Agricultural Experiment Station, North Dakota State University, April 1972.

APPENDIX TABLE 26. COUNT AND PERCENT OF FEMALES 16+ YEARS OLD IN THE EXPERIENCED CIVILIAN LABOR FORCE BY EARNINGS AND OCCUPATION, BURLEIGH AND MORTON COUNTIES, NORTH DAKOTA, 1970

	BURLEIGH						MORTON					
Earnings	Total Civilian Labor	Percent	Clerical Kindred	Percent	Operatives Including Transportation	Percent	Total Civilian Labor	Percent	Clerical Kindred	Percent	Operatives Including Transportation	Percent
None	466	7.0	114	4.5	6	3.4	162	7.7	26	4.6	0	0.0
$1-$999	1,165	17.5	295	11.7	36	20.7	506	24.0	89	15.7	24	25.3
$1,000-$1,999	845	12.7	274	10.9	25	14.4	399	18.9	88	15.5	10	10.5
$2,000-$2,999	877	13.2	207	8.2	45	25.9	302	14.3	77	13.6	16	16.8
$3,000-$3,999	1,153	17.3	570	22.6	42	24.1	329	15.6	146	25.8	15	15.8
$4,000-$4,999	772	11.6	468	18.6	15	8.6	165	7.8	79	14.0	5	5.3
$5,000-$5,999	504	7.6	299	11.9	5	2.9	91	4.3	30	5.3	15	15.8
$6,000-$6,999	311	4.7	137	5.4	0	0.0	70	3.3	13	2.3	10	10.5
$7,000-$7,999	187	2.8	87	3.5	0	0.0	36	1.7	6	1.1	0	0.0
$8,000-$8,999	162	2.4	42	1.7	0	0.0	23	1.1	9	1.6	0	0.0
$9,000-$9,999	95	1.4	6	.2	0	0.0	23	1.1	3	.5	0	0.0
$10,000-$14,999	84	1.3	15	.6	0	0.0	0	0.0	0	0.0	0	0.0
$15,000-Over	36	.5	5	.2	0	0.0	4	.2	0	0.0	0	0.0
TOTAL	6,657	100.0	2,519	100.0	174	100.0	2,110	100.0	566	100.0	95	100.0

SOURCE: Ostenson, Thomas K., North Dakota Income Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue Number Six, North Dakota Agricultural Experiment Station, North Dakota State University, April, 1972.

APPENDIX TABLE 27. COUNT AND PERCENT OF FEMALES 16+ YEARS OLD IN THE EXPERIENCED CIVILIAN LABOR FORCE BY EARNINGS AND OCCUPATION, STARK COUNTY, AND NORTH DAKOTA STATE TOTAL, 1970

	STARK						NORTH DAKOTA					
Earnings	Total Civilian Labor	Percent*	Clerical Kindred	Percent*	Operatives Including Transportation	Percent*	Total Civilian Labor	Percent	Clerical Kindred	Percent*	Operatives Including Transportation	Percent
None	247	10.1	33	5.2	10	9.0	6,266	8.6	1,379	6.6	251	8.4
$1-$999	606	24.8	131	20.6	21	18.9	15,935	21.8	3,442	16.5	633	21.2
$1,000-$1,999	477	19.5	105	16.5	30	27.0	11,387	15.6	2,930	14.1	556	18.6
$2,000-$2,999	338	13.9	79	12.4	23	20.7	10,037	13.8	2,589	12.4	578	19.3
$3,000-$3,999	307	12.6	145	22.8	15	13.5	10,313	14.1	4,144	19.9	520	17.4
$4,000-$4,999	194	8.0	75	11.8	0	0.0	7,016	9.6	3,256	15.6	282	9.4
$5,000-$5,999	142	5.8	47	7.4	0	0.0	4,208	5.8	1,602	7.7	84	2.8
$6,000-$6,999	55	2.3	4	.6	5	4.5	2,996	4.1	728	3.5	37	1.2
$7,000-$7,999	33	1.4	11	1.7	0	0.0	1,913	2.6	450	2.2	17	.6
$8,000-$8,999	20	.8	0	0.0	0	0.0	1,138	1.6	176	.8	6	.2
$9,000-$9,999	5	.2	0	0.0	0	0.0	610	.8	33	.2	0	0.0
$10,000-$14,999	11	.5	0	0.0	7	6.3	813	1.1	67	.3	15	.5
$15,000-Over	5	.2	5	.8	0	0.0	329	.5	30	.1	11	.4
TOTAL	2,440	100.1	635	99.8	111	99.9	72,961	100.0	20,826	99.9	2,990	100.0

*Total percent may not total 100 due to rounding.

SOURCE: Ostenson, Thomas K., North Dakota Income Characteristics by Counties, 1970 Census of Population, Agricultural Economic Statistical Series, Issue Number Six, North Dakota Agricultural Experiment Station, North Dakota State University, April, 1972.

APPENDIX TABLE 28. POPULATION 16+ BY LABOR FORCE STATUS, SELECTED CHARACTERISTICS AND SEX, DUNN, MCLEAN, MERCER, OLIVER COUNTIES, AND NORTH DAKOTA STATE TOTAL, 1970

	DUNN		MCLEAN		MERCER		OLIVER		FOUR COUNTY TOTAL		NORTH DAKOTA	
	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
IN ARMED FORCES	0	0	4	0	0	0	0	0	4	0	10,724	154
IN LABOR FORCE:												
EMPLOYED	1,335	355	2,501	1,013	1,600	532	606	173	6,042	2,073	134,438	70,147
UNEMPLOYED	24	23	186	45	62	18	14	0	286	86	6,474	3,285
NOT IN LABOR FORCE: UNDER 65:												
INMATE	0	0	22	61	0	0	0	0	22	61	1,794	1,293
ENROLLED IN SCHOOL	135	144	273	210	56	148	23	37	487	539	19,279	16,961
OTHER	65	755	357	1,749	119	1,116	85	431	626	4,051	13,325	84,734
65 AND OVER:												
INMATE	0	0	46	50	24	73	0	0	70	123	2,165	3,278
ENROLLED IN SCHOOL	0	0	4	12	0	12	0	0	4	24	135	143
OTHER	108	186	429	576	217	250	51	66	805	1,078	20,601	28,119
TOTAL	1,667	1,463	3,822	3,716	2,078	2,149	779	707	8,346	8,035	208,935	208,114

Source: Ostenson, Thomas K., North Dakota Employment Characteristics By Counties, 1970 Census Of Population, Agricultural Economics Statistical Series, Issue Number Seven, North Dakota Agricultural Experiment Station, North Dakota State University, April 1972.

APPENDIX TABLE 29. POPULATION 16+ BY LABOR FORCE STATUS, SELECTED CHARACTERISTICS, AND SEX, BURLEIGH, MORTON, STARK COUNTIES, AND NORTH DAKOTA STATE TOTAL, 1970

	Burleigh		Morton		Stark		North Dakota	
	Male	Female	Male	Female	Male	Female	Male	Female
In Armed Forces	76	0	5	0	0	0	10,724	154
In Labor Force:								
Employed	9,489	6,377	4,483	2,038	4,280	2,362	134,438	70,147
Unemployed	508	352	191	78	236	93	6,474	3,285
Not in Labor Force:								
Under 65:								
Inmate	207	15	43	33	11	11	1,794	1,293
Enrolled in School	777	944	438	455	697	783	19,279	16,961
Other	481	5,025	310	2,964	353	2,421	13,325	84,734
65 and Over:								
Inmate	76	248	29	48	83	101	2,165	3,278
Enrolled in School	5	5	23	0	0	5	135	143
Other	848	1,414	673	969	483	797	20,601	28,119
Total	12,467	14,381	6,195	6,585	6,143	6,573	208,935	208,114

SOURCE: Ostenson, Thomas K., North Dakota Employment Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue No. 7, North Dakota Agricultural Experiment Station, North Dakota State University, April, 1972.

APPENDIX TABLE 30. COUNT OF EMPLOYED PERSONS 16+ YEARS OLD BY INDUSTRY AND SEX, DUNN, MCLEAN, MERCER AND OLIVER COUNTIES, NORTH DAKOTA, 1970

	DUNN				MCLEAN				MERCER				OLIVER			
	TOTAL	PCT	MALE	FEMALE	TOTAL	PCT	MALE	FEMALE	TOTAL	PCT	MALE	FEMALE	TOTAL	PCT	MALE	FEMALE
AGRICULTURE, FORESTRY, AND FISHERIES	996	58.9	896	100	1224	34.8	1198	26	713	33.4	660	53	495	63.5	464	31
MINING	5	.3	5	0	13	.4	13	0	115	5.4	109	6	9	1.2	9	0
CONSTRUCTION	68	4.0	68	0	261	7.4	253	8	151	7.1	151	0	42	5.4	42	0
FURNITURE, LUMBER AND WOOD PRODUCTS	0	0.0	0	0	7	.2	7	0	0	0.0	0	0	0	0.0	0	0
PRIMARY METAL INDUSTRIES	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0
FABRICATED METAL (INCLUDING NONSPEC. METALS)	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0
MACHINERY, EXCEPT ELECTRICAL	0	0.0	0	0	3	.1	3	0	0	0.0	0	0	0	0.0	0	0
ELECTRICAL MACHINERY, EQUIP & SUPPLIES	0	0.0	0	0	5	.1	5	0	0	0.0	0	0	0	0.0	0	0
MOTOR VEHICLES & OTHER TRANSPORT EQUIP	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0
OTHER DURABLE GOODS	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0
FOOD AND KIND PRODUCTS	0	0.0	0	0	0	0.0	0	0	6	.3	6	0	7	.9	0	7
TEXTILE MILL & OTHER FABRICATED TEXTILES	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0
PRINTING, PUBLISHING, & ALLIED INDUSTRIES	0	0.0	0	0	12	.3	8	4	3	.1	3	0	0	0.0	0	0
CHEMICAL AND ALLIED PRODUCTS	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0
OTHER NONDURABLE GOODS (INCLUDING NON-SPEC MANUFACTURING INDUSTRIES)	0	0.0	0	0	14	.4	9	5	0	0.0	0	0	0	0.0	0	0
RAILROADS & RAILWAY EXPRESS SERVICE	0	0.0	0	0	18	.5	18	0	17	.8	17	0	4	.5	4	0
TRUCKING SERVICE & WAREHOUSING	5	.3	5	0	27	.8	27	0	27	1.3	27	0	5	.6	5	0
OTHER TRANSPORTATION	13	.8	13	0	14	.4	14	0	4	.2	4	0	0	0.0	0	0
COMMUNICATIONS	13	.8	13	0	0	0.0	0	0	22	1.0	22	0	0	0.0	0	0
UTILITIES & SANITARY SERVICES	0	0.0	0	0	76	2.2	71	5	175	8.2	170	5	53	6.8	48	5
WHOLESALE TRADE	27	1.6	27	0	37	1.1	28	9	21	1.0	14	7	12	1.5	12	0
FOOD, BAKERY, & DAIRY STORES	32	1.9	17	15	80	2.3	26	54	69	3.2	40	29	5	.6	0	5
EATING & DRINKING PLACES	31	1.8	17	14	165	4.7	57	108	49	2.3	14	35	16	2.1	4	12
GENERAL MERCHANDISE RETAILING	5	.3	0	5	35	1.0	10	25	13	.6	0	13	0	0.0	0	0
MOTOR VEHICLES RETAILING & SERV. STATION	29	1.7	29	0	81	2.3	81	0	65	3.0	59	6	0	0.0	0	0
OTHER RETAIL TRADE	74	4.4	52	22	252	7.2	147	105	132	6.2	95	37	11	1.4	0	11
BANKING & CREDIT AGENCIES	19	1.1	14	5	62	1.8	40	22	45	2.1	4	41	0	0.0	0	0
INSURANCE, REAL ESTATE, & OTHER FINANCE	10	.6	5	5	19	.5	10	9	26	1.2	16	10	0	0.0	0	0
BUSINESS SERVICES	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0

- continued -

APPENDIX TABLE 30. COUNT OF EMPLOYED PERSONS 16+ YEARS OLD BY INDUSTRY AND SEX (CONTINUED)

	DUNN				MCLEAN				MERCER				OLIVER			
	TOTAL	PCT	MALE	FEMALE	TOTAL	PCT	MALE	FEMALE	TOTAL	PCT	MALE	FEMALE	TOTAL	PCT	MALE	FEMALE
REPAIR SERVICES	38	2.2	38	0	44	1.3	40	4	22	1.0	22	0	3	.4	3	0
PRIVATE HOUSEHOLDS	18	1.1	4	14	69	2.0	8	61	25	1.2	0	25	7	.9	0	7
OTHER PERSONAL SERVICES	0	0.0	0	0	43	1.2	27	16	40	1.9	20	20	10	1.3	0	10
ENTERTAINMENT & RECREATION SERVICES	0	0.0	0	0	32	.9	22	10	3	.1	3	0	0	0.0	0	0
HOSPITALS	10	.6	0	10	146	4.2	17	129	44	2.1	5	39	16	2.1	0	16
MEDICAL & OTHER HEALTH SERVICES EXCEPT HOSPITALS	5	.3	0	5	137	3.9	14	123	44	2.1	5	39	5	.6	0	5
ELEMENTARY, SECONDARY SCHOOLS & COLLEGES:																
GOVERNMENT	115	6.8	38	77	268	7.6	137	131	106	5.0	29	77	46	5.9	5	41
PRIVATE	40	2.4	20	20	107	3.0	51	56	26	1.2	9	17	0	0.0	0	0
OTHER EDUCATION & KINDRED SERVICES	5	.3	0	5	28	.8	5	23	15	.7	0	15	0	0.0	0	0
WELFARE, RELIGIOUS, & NONPROFIT MEMBER ORGANIZATIONS	15	.9	10	5	46	1.3	41	5	47	2.2	38	9	0	0.0	0	0
LEGAL, ENGINEERING AND MISC. PROFESSIONAL SERVICES	22	1.3	10	12	32	.9	17	15	16	.8	0	16	0	0.0	0	0
PUBLIC ADMINISTRATION	95	5.6	54	41	157	4.5	97	60	91	4.3	58	33	33	4.2	10	23
TOTAL	1690		1335	355	3514		2501	1013	2132		1600	532	779		606	173
PERCENT	100.0		79.0	21.0	100.0		71.2	28.8	100.0		75.0	25.0	100.0		77.8	22.2

Source: Ostenson, Thomas K., North Dakota Employment Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue Number Seven, North Dakota Agricultural Experiment Station, North Dakota State University, April 1972.

APPENDIX TABLE 31. COUNT OF EMPLOYED PERSONS 16+ YEARS OLD BY INDUSTRY AND SEX, BURLEIGH, MORTON, AND STARK COUNTIES, NORTH DAKOTA, 1970

	Burleigh				Morton				Stark			
	Total	Percent	Male	Female	Total	Percent	Male	Female	Total	Percent	Male	Female
Agriculture, Forestry, and Fisheries	942	5.9	923	19	1,249	19.2	1,218	31	1,136	17.1	1,041	95
Mining	45	.3	30	15	7	.1	7	0	142	2.1	137	5
Construction	1,600	10.1	1,437	163	533	8.2	507	26	330	5.0	317	13
Furniture, Lumber and Wood Products	6	0.0	6	0	0	0.0	0	0	29	.4	25	4
Primary Metal Industries	0	0.0	0	0	5	.1	5	0	5	.1	5	0
Fabricated Metal (including nonspec. metals)	25	.2	25	0	20	.3	20	0	6	.1	6	0
Machinery, Except Electrical	98	.6	98	0	15	.2	15	0	10	.2	10	0
Electrical Machinery, Equipment and Supplies	19	.1	19	0	4	.1	4	0	5	.1	5	0
Motor Vehicles and Other Transport Equipment	9	.1	9	0	0	0.0	0	0	0	0.0	0	0
Other Durable Goods	130	.8	104	26	76	1.2	76	0	28	.4	23	5
Food and Kind Products	148	.9	112	36	129	2.0	95	34	92	1.4	73	19
Textile Mill and Other Fabricated Textiles	16	.1	10	6	9	.1	4	5	5	.1	0	5
Printing, Publishing, and Allied Industries	227	1.4	167	60	59	.9	44	15	41	.6	28	13
Chemical and Allied Products	44	.3	20	24	0	0.0	0	0	14	.2	10	4
Other Nondurable Goods (including nonspec. manufacturing industries)	119	.8	94	25	179	2.7	155	24	129	1.9	129	0
Railroads and Railway Express Service	108	.7	93	15	254	3.9	228	26	115	1.7	115	0
Trucking Service and Warehousing	177	1.1	131	46	125	1.9	120	5	35	.5	30	5
Other Transportation	84	.5	75	9	31	.5	26	5	49	.7	32	17
Communications	345	2.2	205	140	42	.6	31	11	100	1.5	43	57
Utilities and Sanitary Services	407	2.6	320	87	175	2.7	164	11	86	1.3	72	14
Wholesale Trade	753	4.7	656	97	304	4.7	240	64	264	4.0	256	8
Food, Bakery, and Dairy Stores	442	2.8	298	144	178	2.7	108	70	144	2.2	83	61
Eating and Drinking Places	553	3.5	220	333	321	4.9	66	255	282	4.2	95	187
General Merchandise Retailing	571	3.6	175	396	171	2.6	54	117	162	2.4	59	103
Motor Vehicles Retailing and Service Station	539	3.4	492	47	184	2.8	171	13	268	4.0	251	17

– continued –

APPENDIX TABLE 31. COUNT OF EMPLOYED PERSONS 16+ YEARS OLD BY INDUSTRY AND SEX (CONTINUED)

	Burleigh				Morton				Stark			
	Total	Percent	Male	Female	Total	Percent	Male	Female	Total	Percent	Male	Female
Other Retail Trade	986	6.2	625	361	382	5.9	242	140	512	7.7	343	169
Banking and Credit Agencies	302	1.9	118	184	95	1.5	35	60	107	1.6	50	57
Insurance, Real Estate, and Other Finance	533	3.4	206	227	103	1.6	39	64	117	1.8	73	44
Business Services	176	1.1	105	71	28	.4	15	13	56	.8	37	19
Repair Services	120	.8	100	20	90	1.4	82	8	78	1.2	78	0
Private Households	251	1.6	11	240	124	1.9	9	115	127	1.9	9	118
Other Personal Services	587	3.7	215	372	175	2.7	53	122	280	4.2	84	196
Entertainment and Recreation Services	103	.6	66	37	40	.6	18	22	92	1.4	53	39
Hospitals	1,273	8.0	220	1,053	179	2.7	23	156	315	4.7	33	282
Medical and Other Health Services, Except Hospital	454	2.9	183	271	187	2.9	62	125	177	2.7	24	153
Elementary, Secondary Schools and Colleges												
Government	700	4.4	273	427	339	5.2	140	199	615	9.3	285	330
Private	344	2.2	68	276	132	2.0	44	88	217	3.3	61	156
Other Education and Kindred Services	189	1.2	61	128	31	.5	5	26	24	.4	5	19
Welfare, Religious and Nonprofit Mem. Organizations	456	2.9	238	218	135	2.1	89	46	126	1.9	85	41
Legal, Engineering, and Miscellaneous Professional Services	331	2.1	140	191	83	1.3	44	39	123	1.9	53	70
Public Administration	1,654	10.4	1,041	613	328	5.0	225	103	199	3.0	162	37
Total	15,866		9,489	6,377	6,521		4,483	2,038	6,642		4,280	2,362
Percent	100.0		59.8	40.2	100.0		68.7	31.3	100.0		64.4	35.6

SOURCE: Ostenson, Thomas K., North Dakota Employment Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue No. 7, North Dakota Agricultural Experiment Station, North Dakota State University, April, 1972.

APPENDIX TABLE 32. EMPLOYED PERSONS 16+ YEARS OLD BY OCCUPATION, DUNN, MCLEAN, MERCER, AND OLIVER COUNTIES, NORTH DAKOTA, 1970

	DUNN		MCLEAN		MERCER		OLIVER	
	COUNT	PER CENT	COUNT	PER CENT	COUNT	PER CENT	COUNT	PER CENT
PROFESSIONAL, TECHNICAL, AND KINDRED WORKERS:	135	8.0	453	12.9	199	9.3	34	4.4
ENGINEERS, TECHNICAL	0	0.0	19	.5	5	.2	0	0.0
PHYSICIANS DENTISTS, AND RELATED PRACTITIONERS	0	0.0	19	.5	11	.5	0	0.0
MEDICAL AND OTHER HEALTH WORKERS, EXCEPT PRACTITIONERS	5	.3	84	2.4	5	.2	0	0.0
TEACHERS, ELEMENTARY AND SECONDARY SCHOOLS	79	4.7	185	5.3	90	4.2	22	2.8
TECHNICIANS, EXCEPT HEALTH	5	.3	36	1.0	0	0.0	5	.6
OTHER PROFESSIONAL WORKERS	46	2.7	110	3.1	88	4.1	7	.9
MANAGERS AND ADMINISTRATORS, EXCEPT FARM:	85	5.0	294	8.4	147	6.9	25	3.2
SALARIED: MANUFACTURING	0	0.0	0	0.0	0	0.0	0	0.0
RETAIL TRADE	14	.8	30	.9	47	2.2	6	.8
OTHER INDUSTRIES	52	3.1	136	3.9	53	2.5	9	1.2
SELF-EMPLOYED: RETAIL TRADE	13	.8	106	3.0	32	1.5	4	.5
OTHER INDUSTRIES	6	.4	22	.6	15	.7	6	.8
SALES WORKERS·	64	3.8	139	4.0	64	3.0	10	1.3
MANUFACTURING AND WHOLESALE TRADE	0	0.0	17	.5	3	.1	0	0.0
RETAIL TRADE	54	3.2	106	3.0	45	2.1	10	1.3
OTHER SALES WORKERS	10	.6	16	.5	16	.8	0	0.0
CLERICAL AND KINDRED WORKERS	104	6.2	321	9.1	146	6.8	56	7.2
BOOKKEEPERS	10	.6	65	1.8	27	1.3	5	.6
SECRETARIES, STENOGRAPHERS, AND TYPISTS	28	1.7	26	.7	5	.2	6	.8
OTHER CLERICAL WORKERS	66	3.9	230	6.5	114	5.3	45	5.8
CRAFTSMEN, FOREMEN AND KINDRED WORKERS	95	5.6	334	9.5	296	13.9	78	10.0
AUTOMOBILE MECHANICS AND BODY REPAIRMEN	23	1.4	48	1.4	32	1.5	0	0.0
MECHANICS AND REPAIRMEN, EXCEPT AUTOMOBILE	13	.8	75	2.1	22	1.0	10	1.3
MACHINISTS	0	0.0	6	.2	5	.2	0	0.0
METAL CRAFTSMEN, EXCEPT MECHANICS AND MACHINISTS	0	0.0	0	0.0	13	.6	4	.5
CARPENTERS	4	.2	60	1.7	26	1.2	0	0.0
CONSTRUCTION CRAFTSMEN, EXCEPT CARPENTERS	38	2.2	63	1.8	83	3.9	23	3.0
OTHER CRAFTSMEN	17	1.0	82	2.3	115	5.4	41	5.3

- continued -

APPENDIX TABLE 32. EMPLOYED PERSONS 16+ YEARS OLD BY OCCUPATION (CONTINUED)

	DUNN		MCLEAN		MERCER		OLIVER	
	COUNT	PER CENT	COUNT	PER CENT	COUNT	PER CENT	COUNT	PER CENT
OPERATIVES, EXCEPT TRANSPORT:	18	1.1	86	2.4	96	4.5	11	1.4
DURABLE GOODS, MANUFACTURING	0	0.0	3	.1	0	0.0	0	0.0
NONDURABLE GOODS, MANUFACTURING	0	0.0	4	.1	0	0.0	0	0.0
NONMANUFACTURING INDUSTRIES	18	1.1	79	2.2	96	4.5	11	1.4
TRANSPORT EQUIPMENT OPERATIVES:	30	1.8	83	2.4	81	3.8	0	0.0
TRUCK DRIVERS	14	.8	39	1.1	70	3.3	0	0.0
OTHER TRANSPORT EQUIPMENT OPERATIVES	16	.9	44	1.3	11	.5	0	0.0
LABORERS, EXCEPT FARM:	860	50.9	1,116	31.8	723	33.9	459	58.9
CONSTRUCTION LABORERS	17	1.0	19	.5	39	1.8	5	.6
FREIGHT, STOCK, AND MATERIAL HANDLERS	10	.6	29	.8	40	1.9	3	.4
OTHER LABORERS, EXCEPT FARM	0	0.0	36	1.0	52	2.4	10	1.3
FARMERS AND FARM MANAGERS	833	49.3	1,032	29.4	592	27.8	441	56.6
FARM LABORERS AND FARM FOREMEN	163	9.6	166	4.7	107	5.0	49	6.3
FARM LABORERS, UNPAID FAMILY WORKERS	74	4.4	30	.9	57	2.7	14	1.8
FARM LABORERS, EXCEPT UNPAID, AND FARM FOREMEN	89	5.3	136	3.9	50	2.3	35	4.5
SERVICE WORKERS, EXCEPT PRIVATE HOUSEHOLD:	136	8.0	522	14.9	273	12.8	57	7.3
CLEANING SERVICE WORKERS	34	2.0	95	2.7	84	3.9	12	1.5
FOOD SERVICE WORKERS	55	3.3	204	5.8	47	2.2	28	3.6
HEALTH SERVICE WORKERS	5	.3	82	2.3	45	2.1	0	0.0
PERSONAL SERVICE WORKERS	0	0.0	26	.7	29	1.4	10	1.3
PROTECTIVE SERVICE WORKERS	11	.7	19	.5	18	.8	0	0.0
SERVICE WORKERS, EXCEPT PRIVATE HOUSEHOLD	13	.8	35	1.0	21	1.0	0	0.0
PRIVATE HOUSEHOLD WORKERS	18	1.1	61	1.7	29	1.4	7	.9
TOTAL	1,690	100.0	3,514	100.0	2,132	100.0	779	100.0

Source: Ostenson, Thomas K., North Dakota Employment Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue Number Seven, North Dakota Agricultural Experiment Station, North Dakota State University, April 1972.

APPENDIX TABLE 33. EMPLOYED PERSONS 16+ YEARS OLD BY OCCUPATION, BURLEIGH, MORTON, AND STARK COUNTIES, NORTH DAKOTA, 1970

	Burleigh		Morton		Stark	
	Count	Percent	Count	Percent	Count	Percent
Professional, Technical, and Kindred Workers:	2,873	18.1	822	12.6	856	12.9
Engineers, Technical	281	1.8	46	.7	25	.4
Physicians, Dentists, and Related Practitioners	162	1.0	68	1.0	25	.4
Medical and Other Health Workers, Except Practitioners	510	3.2	71	1.1	89	1.3
Teachers, Elementary and Secondary Schools	510	3.2	345	5.3	291	4.4
Technicians, Except Health	271	1.7	63	1.0	61	.9
Other Professional Workers	1,139	7.2	229	3.5	365	5.5
Managers and Administrators, Except Farm:	1,922	12.1	492	7.5	611	9.2
Salaried: Manufacturing	71	.4	33	.5	7	.1
Retail Trade	476	3.0	114	1.7	171	2.6
Other Industries	1,091	6.9	247	3.8	276	4.2
Self-Employed: Retail Trade	160	1.0	60	.9	81	1.2
Other Industries	124	.8	38	.6	76	1.1
Sales Workers:	1,348	8.5	401	6.1	544	8.2
Manufacturing and Wholesale Trade	304	1.9	56	.9	68	1.0
Retail Trade	789	5.0	285	4.4	366	5.5
Other Sales Workers	255	1.6	60	.9	110	1.7
Clerical and Kindred Workers:	3,059	19.3	719	11.0	878	13.2
Bookkeepers	386	2.4	152	2.3	169	2.5
Secretaries, Stenographers, and Typists	1,068	6.7	199	3.1	173	2.6
Other Clerical Workers	1,605	10.1	368	5.6	536	8.1

- continued -

APPENDIX TABLE 33. EMPLOYED PERSONS 16+ YEARS OLD BY OCCUPATION (CONTINUED)

	Burleigh		Morton		Stark	
	Count	Percent	Count	Percent	Count	Percent
Craftsmen, Foremen, and Kindred Workers	1,821	11.5	937	14.4	664	10.0
Automobile Mechanics and Body Repairmen	271	1.7	76	1.2	92	1.4
Mechanics and Repairmen, Except Auto	270	1.7	147	2.3	92	1.4
Machinists	23	.1	21	.3	5	.1
Metal Craftsmen, Except Mechanics and Machinists	34	.2	61	.9	18	.3
Carpenters	222	1.4	93	1.4	80	1.2
Construction Craftsmen, Except Carpenters	303	1.9	176	2.7	121	1.8
Other Craftsmen	698	4.4	363	5.6	256	3.9
Operatives, Except Transport:	646	4.1	363	5.6	372	5.6
Durable Goods, Manufacturing	64	.4	28	.4	19	.3
Nondurable Goods, Manufacturing	86	.5	98	1.5	101	1.5
Nonmanufacturing Industries	496	3.1	237	3.6	252	3.8
Transport Equipment Operatives	419	2.6	294	4.5	223	3.4
Truck Drivers	220	1.4	152	2.3	120	1.8
Other Transport Equipment Operatives	199	1.3	142	2.2	103	1.6
Laborers, Except Farm:	1,116	7.0	1,020	15.6	1,072	16.1
Construction Laborers	125	.8	39	.6	20	.3
Freight, Stock, and Material Handlers	147	.9	92	1.4	129	1.9
Other Laborers, Except Farm	139	.9	102	1.6	82	1.2
Farmers and Farm Managers	705	4.4	787	12.1	841	12.7
Farm Laborers and Farm Foremen:	178	1.1	423	6.5	259	3.9
Farm Laborers, Unpaid Family Workers	0	0.0	242	3.7	144	2.2
Farm Laborers, Except Unpaid, and Farm Foremen	178	1.1	181	2.8	115	1.7

- continued -

APPENDIX TABLE 33. EMPLOYED PERSONS 16+ YEARS OLD BY OCCUPATION (CONTINUED)

	Burleigh		Morton		Stark	
	Count	Percent	Count	Percent	Count	Percent
Service Workers, Except Private Household:	2,484	15.7	1,050	16.1	1,163	17.5
Cleaning Service Workers	471	3.0	209	3.2	268	4.0
Food Service Workers	788	5.0	417	6.4	452	6.8
Health Service Workers	489	3.1	100	1.5	141	2.1
Personal Service Workers	262	1.7	78	1.2	104	1.6
Protective Service Workers	136	.9	31	.5	42	.6
Service Workers, Except Private Household	96	.6	95	1.5	38	.6
Private Household Workers	242	1.5	120	1.8	118	1.8
Total	15,866	100.0	6,521	100.0	6,642	100.0

SOURCE: Ostenson, Thomas K., North Dakota Employment Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue No. 7, North Dakota Agricultural Experiment Station, North Dakota State University, April, 1972.

APPENDIX TABLE 34. UNDEREMPLOYMENT ESTIMATES BY COUNTY, DUNN, MCLEAN, MERCER, AND OLIVER COUNTIES, NORTH DAKOTA, 1960

	DUNN				MCLEAN			
	% UNDER EMPLOYMENT	% ECONOMIC UTILIZATION	NUMBER OF EMPLOYED CIV	CIVILIAN LABOR FORCE	% UNDER EMPLOYMENT	% ECONOMIC UTILIZATION	NUMBER OF EMPLOYED CIV	CIVILIAN LABOR FORCE
MALE	43.8	56.2	1,652	1,691	33.1	66.9	3,299	3,594
FEMALE	43.0	57.0	468	502	43.1	56.9	995	1,059
TOTAL			2,120	2,193			4,294	4,653
	MERCER				OLIVER			
MALE	26.2	73.8	1,734	1,923	63.0	37.0	705	736
FEMALE	39.4	60.6	585	589	63.8	36.2	127	147
TOTAL			2,319	2,512			832	883

Source: * Underemployment Estimates by County, United States, 1960, Agricultural Economic Report Number 166, Economic Research Service, U.S D.A.

APPENDIX TABLE 35. UNDEREMPLOYMENT ESTIMATES BY COUNTY, BURLEIGH, MORTON, AND STARK COUNTIES, NORTH DAKOTA, 1960

	Burleigh				Morton				Stark			
	Under-Employment	Economic Utilization	Number of Employed Civilians	Civilian Labor Force	Under-Employment	Economic Utilization	Number of Employed Civilians	Civilian Labor Force	Under-Employment	Economic Utilization	Number of Employed Civilians	Civilian Labor Force
	PERCENT	*PERCENT*			*PERCENT*	*PERCENT*			*PERCENT*	*PERCENT*		
Male	13.7	86.3	8,183	8,760	23.7	76.3	5,039	5,493	21.9	78.1	4,203	4,417
Female	27.4	72.6	4,695	4,939	43.6	56.4	1,937	2,063	38.1	61.9	1,946	2,025
Total			12,878	13,699			6,976	7,556			6,149	6,442

SOURCE: Kampe, Ronald E., and William A. Lindamood, Underemployment Estimates by County, United States, 1960, Agricultural Economic Report No. 166, Economic Research Service, USDA.

APPENDIX TABLE 36. MALES 16+ BY AGE AND WEEKS WORKED IN 1969, DUNN, MCLEAN, MERCER, OLIVER COUNTIES, AND NORTH DAKOTA STATE TOTAL

	DUNN			MCLEAN			MERCER			OLIVER			NORTH DAKOTA		
WEEKS	16-24	25-64	65+ YEARS	16-24	25-64	65+ YEARS	16-24	25-64	65+ YEARS	16-24	25-64	65+ YEARS	16-24	25-64	65+ YEARS
50-52	150	921	83	169	1,724	136	105	1,156	71	59	458	13	14,822	97,069	5,428
48-49	9	30	0	20	73	26	16	50	6	0	13	0	1,731	4,554	561
40-47	11	24	5	5	139	21	27	82	6	7	30	0	2,354	5,715	887
27-39	18	45	18	41	195	46	25	76	6	4	23	9	4,097	7,675	2,064
14-26	31	32	7	131	162	61	26	25	21	10	0	0	7,377	3,967	2,618
-13	64	0	37	134	82	79	44	30	37	13	11	23	11,477	2,769	3,610
NO WORK	95	28	59	159	106	313	60	41	168	53	16	37	8,891	5,412	15,857
TOTAL	378	1,080	209	659	2,481	682	303	1,460	315	146	551	82	50,749	127,161	31,025

Source: Ostenson, Thomas K., North Dakota Employment Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue Number Seven, North Dakota Agricultural Experiment Station, North Dakota State University, April 1972.

APPENDIX TABLE 37. MALES 16+ BY AGE AND WEEKS WORKED IN 1969, BURLEIGH, MORTON, STARK COUNTIES, AND NORTH DAKOTA STATE TOTAL

	BURLEIGH			MORTON			STARK			NORTH DAKOTA		
Weeks	16-24	25-64	65+ Years	16-24	25-64	65+ Years	16-24	25-64	65+ Years	16-24	25-64	65+ Years
50-52	844	6,924	295	271	3,232	163	479	2,693	140	14,822	97,069	5,428
48-49	78	225	31	36	98	4	51	121	4	1,731	4,554	561
40-47	130	319	26	25	129	3	107	165	18	2,354	5,715	887
27-39	284	418	66	93	249	52	116	222	22	4,097	7,675	2,064
14-26	324	145	66	122	147	108	323	122	57	7,377	3,967	2,618
-13	438	137	133	267	81	103	466	77	73	11,477	2,769	3,610
No Work	582	298	704	341	152	519	293	155	439	8,891	5,412	15,857
Total	2,680	8,466	1,321	1,155	4,088	952	1,835	3,555	753	50,749	127,161	31,025

SOURCE: Ostenson, Thomas K., North Dakota Employment Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue Number Seven, North Dakota Agricultural Experiment Station, North Dakota State University, April, 1972.

APPENDIX TABLE 38. FEMALES 16+ BY AGE AND WEEKS WORKED IN 1969, DUNN, MCLEAN, MERCER, OLIVER COUNTIES, AND NORTH DAKOTA STATE TOTAL

	DUNN			MCLEAN			MERCER			OLIVER			NORTH DAKOTA		
WEEKS	16-24	25-64	65+ YEARS	16-24	25-64	65+ YEARS	16-24	25-64	65+ YEARS	16-24	25-64	65+ YEARS	16-24	25-64	65+ YEARS
50-52	17	205	21	106	358	64	49	204	49	29	31	20	6,939	24,748	5,177
48-49	0	4	0	0	29	17	5	11	5	6	9	0	893	2,013	464
40-47	23	14	5	10	64	6	16	31	0	7	7	0	2,099	3,829	912
27-39	5	72	6	27	148	52	31	95	5	6	37	13	4,302	8,142	1,893
14-26	29	16	5	51	130	0	35	42	0	11	15	0	6,143	6,229	1,519
-13	54	55	21	131	142	35	66	74	23	10	16	0	9,306	9,114	2,061
NO WORK	162	512	237	252	1,281	813	193	764	451	92	314	84	18,279	56,820	37,232
TOTAL	290	878	295	577	2,152	987	395	1,221	533	161	429	117	47,961	110,895	49,258

Source: Ostenson, Thomas K., North Dakota Employment Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue Number Seven, North Dakota Agricultural Experiment Station, North Dakota State University, April 1972.

APPENDIX TABLE 39. FEMALES 16+ BY AGE AND WEEKS WORKED IN 1969, BURLEIGH, MORTON, STARK COUNTIES, AND NORTH DAKOTA STATE TOTALS

	BURLEIGH			MORTON			STARK			NORTH DAKOTA		
Weeks	16-24	25-64	65+ Years	16-24	25-64	65+ Years	16-24	25-64	65+ Years	16-24	25-64	65+ Years
50-52	738	2,656	381	216	740	113	245	830	130	6,939	24,748	5,177
48-49	69	121	27	10	34	15	24	78	20	893	2,013	464
40-47	163	271	35	24	78	0	62	167	20	2,099	3,829	912
27-39	431	526	92	76	329	43	140	262	69	4,302	8,142	1,893
14-26	439	403	94	193	228	22	359	182	36	6,143	6,229	1,519
-13	557	545	121	209	267	16	409	268	60	9,306	9,114	2,061
No Work	1,281	3,512	1,919	632	1,995	1,345	668	1,486	1,058	18,279	56,820	37,232
Total	3,678	8,034	2,669	1,360	3,671	1,554	1,907	3,273	1,393	47,961	110,895	49,258

SOURCE: Ostenson, Thomas K., North Dakota Employment Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue Number Seven, North Dakota Agricultural Experiment Station, North Dakota State University, April, 1972.

APPENDIX TABLE 40. LABOR FORCE PARTICIPATION RATES,[a] DUNN, MCLEAN, MERCER, AND OLIVER COUNTIES, NORTH DAKOTA, 1970

Age Group	McLean			Mercer			Oliver			Dunn		
	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes
16-17	35.8	30.5	29.9	58.6	15.9	34.4	20.8	0.0	7.7	39.1	9.2	25.4
18-19	43.6	35.0	39.3	83.6	26.4	52.6	19.4	46.7	35.5	57.6	14.8	48.9
20-21	100.0	69.8	82.6	88.2	14.3	50.7	76.9	100.0	82.6	81.5	60.0	71.2
22-24	87.3	47.0	65.6	84.5	43.4	60.0	71.8	32.8	48.5	100.0	41.5	66.7
25-34	90.8	25.8	58.5	93.9	25.3	61.3	96.2	23.1	63.7	93.7	24.6	57.2
35-44	94.7	36.3	63.2	97.0	33.1	65.4	96.9	13.4	57.0	100.0	36.6	71.8
45-64	80.9	33.7	58.1	91.2	31.0	61.5	89.0	29.6	61.1	94.2	29.3	64.1
65+	29.8	5.6	17.7	23.5	4.6	13.5	37.8	0.0	20.9	48.3	5.1	27.4
Total	70.4	28.5	49.7	80.0	25.6	52.3	79.6	24.5	53.4	81.5	25.8	55.5
Total Excluding Military	70.3	28.5	49.7	80.0	25.6	52.3	79.6	24.5	53.4	81.5	25.8	55.5

[a] Labor force participation rate is defined as the proportion of the population of certain age groups who are members of the labor force.

SOURCES: Ostenson, Thomas K., North Dakota Employment Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue No. 7, North Dakota Agricultural Experiment Station, North Dakota State University, April, 1972.

Ostenson, Thomas K., North Dakota General Population Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue No. 9, North Dakota Agricultural Experiment Station, North Dakota State University, April, 1972.

APPENDIX TABLE 41. LABOR FORCE PARTICIPATION RATES,[a] BURLEIGH, MORTON, AND STARK COUNTIES, NORTH DAKOTA, 1970

	Burleigh			Morton			Stark		
Age Group	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes
16 - 17	42.9	30.2	36.5	34.4	20.7	27.7	43.6	25.5	34.9
18 - 19	63.8	63.1	63.4	48.7	50.5	49.6	56.4	49.7	52.8
20 - 21	75.1	71.7	72.9	82.9	61.5	67.5	67.1	54.0	60.0
22 - 24	87.4	59.1	70.6	91.7	46.1	65.5	79.0	50.5	65.7
25 - 34	95.5	44.1	68.9	96.8	31.1	64.5	92.6	38.2	66.0
35 - 44	96.0	51.6	74.5	97.4	41.3	68.8	97.2	43.3	69.7
45 - 64	90.4	68.3	71.5	89.2	34.5	61.9	85.3	41.2	62.4
65+	29.7	11.2	18.8	23.8	9.4	16.0	24.8	8.0	15.3
Total	80.8	46.8	62.8	75.5	32.1	53.2	73.5	37.3	54.8

[a] Labor force participation rate is defined as the proportion of the population of a certain age group who are members of the civilian labor force.

SOURCES: Ostenson, Thomas K., North Dakota Employment Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue No. 7, North Dakota Agricultural Experiment Station, North Dakota State University, April, 1972.

Ostenson, Thomas K., North Dakota General Population Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue No. 9, North Dakota Agricultural Experiment Station, North Dakota State University, April, 1972.

APPENDIX TABLE 42. COUNT OF PERSONS AT WORK DURING WEEK OF CENSUS BY MEANS OF TRANSPORTATION TO WORK, DUNN, MCLEAN, MERCER, OLIVER COUNTIES, AND NORTH DAKOTA STATE TOTAL, 1970

	DUNN	MCLEAN	MERCER	OLIVER	NORTH DAKOTA
PRIVATE AUTO, DRIVER	358	1,424	794	231	114,429
PRIVATE AUTO, PASSENGER	30	201	56	5	19,071
BUS/STREETCAR	0	8	0	0	1,093
SUBWAY/ELEVATED	0	0	0	0	7
RAILROAD	0	0	0	0	32
TAXI	0	0	0	0	755
WALKED ONLY	187	564	623	249	35,170
OTHER MEANS	126	50	72	7	6,262
WORKED AT HOME	1,021	1,260	565	306	38,767
TOTAL	1,722	3,507	2,110	798	215,586

Source: Ostenson, Thomas K., North Dakota Employment Characteristics by Counties, 1970 Census of Population, Agricultural Economics Statistical Series, Issue Number Seven, North Dakota Agricultural Experiment Station, North Dakota State University, April 1972.

APPENDIX TABLE 43. GENERAL HOUSING CHARACTERISTICS IN DUNN, MCLEAN, MERCER, AND OLIVER COUNTIES, NORTH DAKOTA, 1970

COUNTY	ALL HOUSING UNITS	VACANT SEASONAL AND MIGRATORY	ALL YEAR AROUND UNITS	OWNER OCCUPIED UNITS	RENTER OCCUPIED UNITS	VACANT YEAR-ROUND UNITS	POPULATION IN HOUSING UNITS	POPULATION PER HOUSING UNIT	UNITS WITH ALL PLUMBING FACILITIES	UNITS LACKING SOME OR ALL PLUMBING FACILITIES	MEDIAN ROOMS ALL UNITS	MEDIAN PERSONS ALL UNITS
DUNN	1,605	38	1,567	1,075	241	251	4,963	3.8	1,152	415	5.1	3.1
MCLEAN	4,282	365	3,917	2,534	817	566	10,913	3.3	3,195	722	5.0	2.7
MERCER	2,253	92	2,161	1,631	308	222	6,157	3.2	1,829	332	4.9	2.7
OLIVER	767	0	767	530	110	127	2,355	3.7	610	157	5.2	3.3

Source: General Housing Characteristics North Dakota, 1970 Census of Housing, U.S. Department of Commerce, Bureau of Census, Series HC(1)-A36, June 1971.

APPENDIX TABLE 44. GENERAL HOUSING CHARACTERISTICS IN BURLEIGH, MORTON, AND STARK COUNTIES, NORTH DAKOTA, 1970

County	All Housing Units	Vacant Seasonal and Migratory	All Year Around Units	Owner Occupied Units	Renter Occupied Units	Vacant Year Around Units	Population in Housing Units	Population Per Housing Unit	Units With All Plumbing Facilities	Units Lacking Some or All Plumbing Facilities	Median Rooms All Units	Median Persons All Units
Burleigh	12,983	19	12,964	7,870	4,299	795	39,633	3.3	12,171	793	4.7	2.9
Morton	6,317	26	6,291	4,337	1,504	450	20,131	3.4	5,763	528	4.9	3.0
Stark	5,747	11	5,736	3,757	1,528	451	18,457	3.5	5,179	557	4.7	2.9

SOURCE: General Housing Characteristics North Dakota, 1970 Census of Housing, U.S. Department of Commerce, Bureau of Census, Series HC(1)-A36, June, 1971.

APPENDIX TABLE 45. DETAILED HOUSING CHARACTERISTICS IN DUNN, MCLEAN, MERCER AND OLIVER COUNTIES, NORTH DAKOTA, 1970

	---TELEPHONES---		---------AUTOMOBILES---------				---HOME HEATING FUEL---							
COUNTY	AVAILABLE	NONE	1	2	3 or MORE	NONE	UTILITY GAS	FUEL OIL, KEROSENE	COAL OR COKE	WOOD	ELECTRICITY	BOTTLED, TANK OR L.P. GAS	OTHER FUEL	NONE
DUNN	1,067	249	878	268	71	99	20	342	383	0	39	508	0	0
MCLEAN	2,926	425	1,912	944	103	392	1,593	789	377	0	169	438	0	0
MERCER	1,783	156	1,320	419	44	156	0	353	779	0	39	597	19	0
OLIVER	557	83	462	115	14	44	20	120	315	0	18	161	0	0

Source: Detailed Housing Characteristics North Dakota, 1970 Census of Housing, U.S. Department of Commerce, Bureau of Census, Series HC(1) - B36, January 1972.

APPENDIX TABLE 45. DETAILED HOUSING CHARACTERISTICS IN DUNN, MCLEAN, MERCER AND OLIVER COUNTIES, NORTH DAKOTA, 1970
(CONTINUED)

	SOURCES OF WATER			SEWAGE DISPOSAL			HEATING EQUIPMENT OF UNITS							
COUNTY	PUBLIC SYSTEM OR PRIVATE COMPANY	INDIVIDUAL WELL	OTHER	PUBLIC SEWER	SEPTIC TANK OR CESSPOOL	OTHER	STEAM OR HOT WATER	WARM-AIR FURNACE	BUILT IN ELECTRIC UNITS	FLOOR, WALL OR PIPELESS FURNACE	ROOM HEATERS WITH FLUCTUATION	ROOM HEATERS WITHOUT FLUCTUATION	FIREPLACE STOVES OR PORTABLE HEATERS	NONE
DUNN	367	1,146	65	407	727	444	52	818	64	56	314	42	156	65
MCLEAN	1,982	1,711	227	1,940	1,328	652	438	2,608	118	132	319	71	139	92
MERCER	1,175	964	37	1,307	635	234	193	1,711	29	9	121	17	54	27
OLIVER	229	519	19	242	359	166	36	587	48	43	25	0	28	0

Source: Detailed Housing Characteristics North Dakota, 1970 Census of Housing, U.S. Department of Commerce, Bureau of Census, Series HC(1) - B36, January 1972.

APPENDIX TABLE 46. DETAILED HOUSING CHARACTERISTICS IN BURLEIGH, MORTON, AND STARK COUNTIES, NORTH DAKOTA, 1970

	Telephones		Automobiles				Home Heating Fuel							
County	Available	None	One	Two	Three or More	None	Utility Gas	Fuel Oil, Kerosene	Coal or Coke	Wood	Electricity	Bottled, Tank or L.P. Gas	Other Fuel	None
Burleigh	11,398	771	5,993	4,174	709	1,293	10,551	455	96	0	331	682	47	45
Morton	5,424	417	3,167	1,659	271	744	4,346	368	556	0	100	623	0	0
Stark	4,796	489	2,763	1,534	297	700	4,186	230	237	0	209	397	18	0

(Continued)

APPENDIX TABLE 46. DETAILED HOUSING CHARACTERISTICS IN BURLEIGH, MORTON, AND STARK COUNTIES, NORTH DAKOTA, 1970 (CONTINUED)

	Sources of Water			Sewage Disposal			Heating Equipment of Units							
County	Public System or Private Company	Individual Well	Other	Public Sewer	Septic Tank or Cesspool	Other	Steam or Hot Water	Warm-Air Furnace	Built-in Electric Units	Floor, Wall or Pipeless Furnace	Room Heaters With Flue	Room Heaters Without Flue	Fireplace Stoves or Portable Heaters	None
Burleigh	11,418	1,480	66	11,384	1,263	317	2,043	9,589	186	131	646	139	151	79
Morton	4,807	1,440	35	4,757	1,179	346	1,447	3,866	48	151	639	56	77	7
Stark	4,075	1,553	108	4,163	1,173	400	1,098	3,761	80	132	515	48	76	26

SOURCE: Detailed Housing Characteristics North Dakota, 1970 Census of Housing, U.S. Department of Commerce, Bureau of Census, Series HC(1)-B36, January, 1972.

APPENDIX TABLE 47. HOSPITAL FACILITIES BY COUNTY IN 1972, REGION 7 OF NORTH DAKOTA

County By Hospital Facility And Location	Entire Acute Facility									Chronic Patients			
	Bed Capacity	Conforming	Non-Conforming	No. Bassinets	No. of Patients Admitted	Patient Days	Avg. Length Of Stay	% Occupancy	ADC	Chronic Occupancy	Chronic Patient Days	Chronic Patients Admitted	Chronic ADC
Burleigh County													
Bismarck Hospital Bismarck, ND	195	195		22	5,898	46,261	7.8	64.8	126.4	-	-	-	-
St. Alexius Hospital Bismarck, ND	231	231		24	8,772	56,190	6.4	66.5	153.5	-	-	-	-
Emmons County													
Linton Hospital Linton, ND	32	32		5	941	5,775	6.1	49.3	15.8	-	-	-	-
Grant County													
Lorenzen Memorial Hosp. Elgin, ND	25						6.3	71.7		-	-	-	-
Kidder County													
No Hospital Facility													
McLean County													
Garrison Memorial Hosp. Garrison, ND	62	40	22	2	1,197	7,875	6.6	34.7	21.5	.2	33	2	.1
Turtle Lake Community Memorial Hospital, Turtle Lake, ND	40	40		6	751	4,918	6.5	33.6	13.4	-	-	-	-
Mercer County													
Hazen Memorial Hosp. Hazen, ND	39	39		5	1,486	8,973	6.0	62.9	24.5	-	-	-	-
Morton County													
Mandan Hospital Mandan, ND	63	63		11	1,674	9,424	5.6	40.9	25.7	-	-	-	-
Oliver County Sheridan County Sioux County	No Hospital Facility												

SOURCE: Busch, Clemens R. and Cynthia Phillips, North Dakota "Hill-Burton" Hospital Survey, North Dakota State Department of Health Bismarck, North Dakota, May, 1973.

APPENDIX TABLE 48. HOSPITAL FACILITIES BY COUNTY IN 1972, REGION 8 OF NORTH DAKOTA

County By Hospital Facility And Location	Entire Acute Facility									Chronic Patients			
	Bed Capacity	Conforming	Non-Conforming	No. Bassinets	No. of Patients Admitted	Patient Days	Avg. Length Of Stay	% Occupancy	ADC	Chronic Occupancy	Chronic Patient Days	Chronic Patients Admitted	Chronic ADC
Adams County													
Community Memorial Hosp.	30	30		6	1,606	10,644	6.6	96.9	29.1	-	-	-	-
Hettinger, ND													
Billings County													
No Hospital Facility													
Bowman County													
St. Lukes Tri State Hosp.													
Bowman, ND	40	40		8	1,051	8,232	7.8	56.2	22.5	-	-	-	-
Dunn County													
No Hospital Facility													
Golden Valley County													
Golden Valley Hosp.													
Beach, ND	27						6.6	47.0		-	-	-	-
Hettinger County													
No Hospital Facility													
Slope County													
No Hospital Facility													
Stark County													
St. Josephs Hospital													
Dickenson, ND	120	120		18	4,329	26,072	6.0	59.4	71.2	-	-	-	-
Memorial Hospital													
Richardton, ND	31	31		4	655	4,498	6.8	40.0	12.3	-	-	-	-

SOURCE: Busch, Clemens R. and Cynthia Phillips, North Dakota "Hill-Burton" Hospital Survey, North Dakota State Department of Health, Bismarck, North Dakota, May, 1973.

APPENDIX TABLE 49. NURSING HOME FACILITIES BY COUNTY IN 1973, REGION 7 OF NORTH DAKOTA

County By Nursing Home Facility & Location	Bed Capacity						
	Existing	Conforming	Non-Conforming	% Occupancy	Patient Days	Patients Admitted	ADC
Burleigh County, Baptist Home, Bismarck, ND	64	64		100.8	23,607	38	64.5
Missouri Slope Lutheran Home, Bismarck, ND	83	83		100.7	30,600	38	83.6
St. Vincent's Nursing Home, Bismarck, ND	94	94		98.4	33,850	44	92.4
Emmons County, Strasburg Nursing Home, Strasburg, ND	76	76		95.0	26,416	16	72.1
Grant County, No Nursing Home Facility							
Kidder County, No Nursing Home Facility							
McLean County, Garrison Nursing Home, Garrison, ND	71	71		98.5	25,598	52	69.9
Praire View Home, Underwood, ND	64	64		95.7	22,415	27	61.2
Mercer County, Beulah Community Nursing Home, Beulah, ND	40	40		100.2	14,670	16	40.1
Morton County, Marian Manor Nursing Home, Glen Ullin, ND	80	80		95.5	27,965	17	76.4
Oliver County, No Nursing Home Facility							
Sheridan County, No Nursing Home Facility							
Sioux County, No Nursing Home Facility							

SOURCE: Busch, Clemens R., and Cynthia Phillips, North Dakota "Hill-Burton" Nursing Home Survey, North Dakota State Department of Health, Bismarck, North Dakota, May, 1973.

APPENDIX TABLE 50. NURSING HOME FACILITIES BY COUNTY IN 1973, REGION 8 OF NORTH DAKOTA

County By Nursing Home Facility & Location	Bed Capacity						
	Existing	Conforming	Non-Conforming	% Occupancy	Patient Days	Patients Admitted	ADC
Adams County, Challenge Nursing Home, Hettinger, ND	88	88		95.9	30,866	37	84.4
Billings County, No Nursing Home Facility							
Bowman County, St. Lukes Sunset Home, Bowman, ND	42	42		104.5	16,059	17	43.9
Dunn County, No Nursing Home Facility							
Golden Valley, Johnstone Memorial Nursing Home, Beach, ND	25		25	90.9	8,316	14	22.7
Hettinger County, No Nursing Home Facility							
Slope County, No Nursing Home Facility							
Stark County, Dickinson Nursing Home, Dickinson, ND	54	54		97.5	19,274	39	52.7
St. Lukes, Home, Dickinson, ND	83	83		92.1	27,976	49	76.4

SOURCE: Busch, Clemens R., and Cynthia Phillips, North Dakota "Hill-Burton" Nursing Home Survey, North Dakota State Department of Health, Bismarck, ND, May, 1973.

APPENDIX TABLE 51. INVENTORY OF MUNICIPAL SEWAGE SYSTEMS, NORTH DAKOTA STATE REGION 7, CITIES AND VILLAGES WITH 1960 POPULATION OF 75 TO 10,000, AS OF SEPTEMBER 15, 1972

	Population[a]				Construction Projects		Estimated Cost[b]					Federal Financing		
County by City	1960	1970	Year Coll. was Installed	First Year Treatment Plant was Used	Description of Project	Year	Total Costs	Coll. System	Treatment Facilities	Amount of WPC or EPA[c] Grant	EPA Designation 1968[d]	FHA Loan	FHA Grant	Other Grants
Burleigh														
Regan	104	74	--	--										
Wing	303	223	1958	1958	Coll. System, lagoon	1958	49,480	25,920	23,560	7,070	7	--	--	--
Wilton	739	695	1934	1947	Coll. System	1934	NA	NA	NA	0		--	--	--
					Imhoff Tank	1947	NA	0	NA	0		--	--	--
					Replaced Tank with Lagoon	1965	11,700	0	11,700		7	--	--	WPC
Emmons														
Braddock	141	106	--	--										
Hague	197	146	1968	1968	Coll. System, Lagoon	1968	90,440	52,200	38,240	11,470		yes	yes	WPC
Hazelton	451	374	1955	1955	Coll. System, Lagoon	1955	75,500	50,800	24,200	0	7	--	--	--
Linton	1,826	1,695	1926	1937	Coll. System, Raw to Creek	1926	NA	NA	0	0		0	0	0
					Secondary Treatment Plant	1937	NA	0	NA	0		0	0	0
					Lagoon	1960	63,370	0	63,370	17,020	7	0	0	WPC
Strasburg	612	642	1946	1946	Coll. System, Imhoff Tank	1946	NA	NA	NA	0	4	--	--	--
Grant														
Carson	501	466	1947	1947	Coll. System, Imhoff Tank	1947	NA	NA	NA	0		--	--	--
					Replaced Tank with Lagoon	1963	7,500	0	7,500	0	7	--	--	--
Elgin	944	839	1937	1937	Coll. System, Imhoff Tank	1937	NA	NA	NA	0		--	--	--
					Replaced Tank with Lagoon	1954	26,500	0	26,500	0	7	--	--	--
Leith	100	92	--	--										
New Leipzig	390	354	1948	1948	Coll. System, Imhoff Tank	1948	NA	NA	NA	0	4	--	--	--
					Expanded Sewer Lines	?	8,010	8,010	0	0		--	--	--

(Continued)

APPENDIX TABLE 51. INVENTORY OF MUNICIPAL SEWAGE SYSTEMS, NORTH DAKOTA STATE REGION 7, (CONTINUED)

County by City	Population[a] 1960	Population[a] 1970	Year Coll. was installed	First Year Treatment Plant was Used	Construction Projects: Description of Project	Year	Estimated Cost[b]: Total Costs	Coll. System	Treatment Facilities	Amount of WPC or EPA[c] Grant	EPA Designation 1968[c]	Federal Financing: FHA Loan	FHA Grant	Other Grants
Golden Valley	286	235	1956	1956	Coll. System, Lagoon	1956	61,700	41,000	20,700	0	7	--	--	--
Hazen	1,222	1,240	1940	1940	Coll. System, Raw to Stream	1930	NA	NA	NA	0		--	--	WPC
					Imhoff Tank	1940	NA	0	NA	0		--	--	--
					Replaced Tank with Lagoon	1960	44,000	0	44,000	12,640	7	--	--	--
Pick City	101	119	--	--										
Stanton	409	517	1937	1970	Coll. System Raw to Knife R.	1937	NA	NA	0	0		--	--	--
					Lagoon, Extension of Lines	1970	44,510	NA	NA	?	0	Yes	No	EPA
Zap	339	271	1949	1949	Coll. System, Imhoff Tank	1949	NA	NA	NA	0	0	--	--	--
					Lagoon Other Improvements	1972	35,810	0	35,810	?	4	--	--	EPA
Morton														
Almont	190	109	1967	1967	Coll. System, Lagoon	1967	51,850	35,640	16,210	4,860	7	Yes	Yes	WPC
Flasher	515	467	1953	1953	Coll. System, Lagoon	1953	82,500	45,260	37,240	0	7	--	--	--
Glen Ullin	1,210	1,070	1940	1940	Coll. System, Imhoff Tank	1940	NA	NA	NA	0		--	--	WPC
					Replaced Tank with Lagoon	1962	32,540	0	32,540	9,760	7	--	--	--
Hebron	1,340	1,103	1929	1929	Coll. System, Septic Tank	1929	NA	NA	NA	0		--	--	WPC
					Secondary Treatment Plant	1942	NA	0	NA	0		--	--	--
					Replaced Treatment Plant with Lagoon	1960	19,550	0	19,550	5,210	7	--	--	--
New Salem	936	943	1940	1940	Coll. System, Imhoff Tank	1940	NA	NA	NA	0		--	--	--
					Replaced Tank with Lagoon	1955	18,700	0	18,700	0	7	--	--	--
Oliver														
Center	476	619	1953	1953	Coll. System, Lagoon	1953	75,140	40,890	34,250	0		--	--	--
					New Lagoon, Other Improvements	1971	58,850[f]	NA	NA	18,000	7	Yes	No	EPA
Sheridon														
Goodrich	392	300	1916	1937	Coll. System, Raw to Stream	1916	NA	NA	0	0		--	--	--
					Imhoff, Tank	1937	NA	0	NA	0	7	--	--	--
					Replaced Tank with Lagoon	1962	20,240	0	20,240	6,070		--	--	WPC

(Continued)

APPENDIX TABLE 51. INVENTORY OF MUNICIPAL SEWAGE SYSTEMS, NORTH DAKOTA STATE REGION 7, (CONTINUED)

County by City	Population[a]		Year Coll. was installed	First Year Treatment Plant was Used	Construction Projects						EPA Designation 1968[c]	Federal Financing		
							Estimated Cost[b]							
	1960	1970			Description of Project	Year	Total Costs	Coll. System	Treatment Facilities	Amount of WPC or EPA[c] Grant		FHA Loan	FHA Grant	Other Grants
Kidder														
Dawson	206	131	--	--										
Pettibone	205	173	--	--										
Robinson	155	125	1969	1969	Coll. System, Lagoon	1969	58,000	60,960	27,040	8,100		yes	yes	EPA
Steele	847	696	1936	1936	Coll. System, Imhoff Tank	1936	NA	NA	NA	0	4	--	--	--
Tappen	326	294	--	--										
Tuttle	255	216	1959	1959	Coll. System Lagoon	1959	71,510	37,160	34,350	10,300	7	--	--	WPC
McLean														
Benedict	129	72	--	--										
Butte	257	193	1950	1950	Coll. System, Lagoon	1950	44,500	38,000	6,500	0	7	--	--	--
Coleharbor	210	78	--	--										
Garrison	1,794	1,614	1936	1936	Coll. System, Imhoff Tank	1936	NA	NA	NA	0		--	--	--
					Replaced Tank with Lagoon	1954	25,000	0	25,000	0	7	--	--	--
					Extended Water & Sewer Lines	1962	e	e	0	0		--	--	--
					Extended Water & Sewer Lines	1963	e	e	0	0		--	--	--
Max	410	301	1952	1952	Coll. System, Lagoon	1951	48,000	27,850	20,150	0	7	--	--	--
Mercer	154	132	1968	1968	Coll. System, Lagoon	1950	96,000	43,300	52,700	0	7	--	--	--
Turtle Lake	792	712	1938	1938	Coll. System, Imhoff Tank	1938	NA	NA	NA	0		--	--	--
					Replaced Tank with Lagoon	1956	46,700	0	46,700	0	7	--	--	--
					Additional Lagoon	1972	14,430	0	14,430	?		No	No	No
Underwood	819	781	1947	1947	Coll. System, Imhoff Tank	1947	NA	NA	NA	0		--	--	--
					Replaced Tank with Lagoon	1960	53,110	0	53,110	15,036	7	--	--	WPC
Washburn	993	804	1920	1971	Coll. System Raw to MO River	1920	NA	NA	NA		0	--	--	--
					Lagoons	1971	77,450	0	77,450	?	0	No	No	?
Mercer														
Beulah	1,318	1,344	1929	1929	Coll. System, Septic Tank	1929	NA	NA	NA	0		--	--	--
					Replaced Tank with lagoon	1962	67,270	0	67,270	20,180	7	--	--	WPC
					Improvement to Water and Sewer System	1963	e	e	e	0		--	--	--

(Continued)

APPENDIX TABLE 51. INVENTORY OF MUNICIPAL SEWAGE SYSTEMS, NORTH DAKOTA STATE REGION 7, (CONTINUED)

	Population[a]				Construction Projects							Federal Financing		
							Estimated Cost[b]							
ounty by City	1960	1970	Year Coll. was installed	First Year Treatment Plant was Used	Description of Project	Year	Total Costs	Coll. System	Treatment Facilities	Amount of WPC or EPA[c] Grant	EPA Designation 1968	FHA Loan	FHA Grant	Other Grants
McClusky	751	664	1930	1936	Coll. System	1930	NA	NA	0	0		--	--	--
					Imhoff Tank	1936	NA	0	NA	0	7	--	--	--
					Replaced Tank with Lagoon	1958	26,050	0	26,050	7,820		--	--	WPC
					Additional Lagoon	1969	25,000[f]	0	25,000	3,000		Yes	No	EPA
Martin	146	120	--	--										
ioux														
Fort Yates	921*h	1,153	1937	1937	Coll. System, Imhoff Tank	1937	NA	NA	NA	0		--	--	BIA
					Replaced Tank with Lagoon	1962	52,510	0	52,510	?	7	--	--	BIA
					Extension to Water & Sewer Systems	1970	e	e	e	?		Yes	No	BIA
					Improvement to Sewer System	1972	14,260	NA	NA	?		--	--	EDA
Selfridge	371	346	1957	1957	Coll. System, Lagoon	1957	40,490	31,060	9,430	2,830	7	--	--	WPC
Solen	250*	180	1971	1971	Coll. System, Lagoon	1971	136,000[f]	NA	NA	10,950	?	Yes	No	EDA

---

ost of these data are from the U.S. Census of Population for 1960 and 1970. Figures in asterisk* are from Rand-McNalley Commercial Atlas and Marketing Guide, 1961 and 1972, Edition.

Unless otherwise noted, the figures given are cost estimates made by engineers in the Water Supply and Pollution Control Division, North Dakota State Department of Health, from the amounts in contract awards, plus 15 percent to cover costs of land, right-of-way, engineering, planning, and legal work.

There are now known as "EPA Grants"

Code members for 1968 EPA designations are as follows:

0. Needs new treatment facilities (had none in 1968).
1. Need enlargement of existing facilities.
2. Needs addition of other treatment methods to existing facilities.
3. Needs chlorination.
4. Existing plant should be closed, because it is obsolete.
5. Improved operation or utilization of existing facilities is all that would be needed.
6. Should be connected to an adequate existing sewer system.
7. No project is needed.

[e] Cost data of Water Supply and Pollution Control Division are not separated between water and sewer projects. See "Inventory of Water Systems", for total construction costs or both water and sewage projects.

[f] Cost estimates made by State Office of FHA.

[g] Cost estimates are not readily available in Office of Water Supply and Pollution Control Division.

[h] The 1960 population estimate was made by the North Dakota Industrial Development Commission.

APPENDIX TABLE 52. INVENTORY OF MUNICIPAL SEWAGE SYSTEMS, NORTH DAKOTA STATE REGION 8, CITIES AND VILLAGES WITH 1960 POPULATION OF 75 TO 10,000, AS OF SEPTEMBER 15, 1972

ounty by City	Population[a] 1960	Population[a] 1970	Year Coll. was Installed	First Year Treatment Plant was Used	Construction Projects: Description of Project	Year	Estimated Cost[b]: Total Costs	Estimated Cost[b]: Coll. System	Estimated Cost[b]: Treatment Facilities	Amount of WPC or EPA[c] Grant	EPA Designation 1968[d]	Federal Financing: FHA Loan	Federal Financing: FHA Grant	Federal Financing: Other Grants
dams														
Haynes	111	53	--	--										
Hettinger	1,769	1,655	1919	1923	Coll. System, Raw to Creek	1919	NA	NA	NA	0		--	--	--
					Septic Tank	1923	NA	0	NA	0		--	--	--
					Replaced Tank with Lagoon	1957	39,920	0	39,920	11,980	7	--	--	WPC
					Extended Water & Sewer Lines	1970	e	e	0	0		No	No	No
Reeder	321	306	1958	1958	Coll. System, Lagoon	1957	45,010	34,720	10,290	3,090	7	--	--	WPC
illings														
Medora	133	129	1962	1962	Coll. System, Lagoon	1962	43,550	22,050	21,000	6,450	7	--	--	WPC
owman														
Bowman	1,730	1,762	1938	1938	Coll. System, Imhoff Tank	1938	NA	NA	NA	0		--	--	--
					Replaced Imhoff Tank with Lagoon	1956	35,800	0	35,800	0	7	--	--	--
					Additional Cell in Lagoon	1968	8,600	0	8,600	?		--	--	?
					Additional Cell in Lagoon	1972	21,090	0	21,090	?		--	--	?
					Extended Water & Sewer Lines	1961	e	e		0		--	--	--
					Extended Water & Sewer Lines	1968	e	e		0		--	--	--
Rhame	254	206	1968	1968	Coll. System Lagoon	1968	85,200	71,760	13,460	3,600	7	Yes	Yes	EPA
Scranton	358	360	1938	1938	Coll. System, Imhoff	1938	NA	NA	NA	0	7	--	--	--
					Replaced Tank with Lagoon	1955	27,600	0	27,600	0		--	--	--
unn														
Dunn Center	250	107	1954	1954	Coll. System Lagoon	1954	54,300	28,100	26,200	0	7	--	--	--
Halliday	509	413	1953	1953	Coll. System Lagoon	1953	62,000	29,500	32,500	0	7	--	--	--
Killdeer	765	615	1935	1940	Coll. System Raw to Creek	1935	NA	NA	0	0				
					Imhoff Tank	1940	NA	0	NA	0				
					Replaced Tank with Lagoon	1957	11,700	0	11,700	3,510	7	--	--	WPC
Dodge	226	121	1957	1957	Coll. System Lagoon	1957	34,320	27,570	6,750	2,030	7	--	--	WPC
olden Valley														
Beach	1,460	1,408	1912	1912	Coll. System Septic Tank	1912	NA	NA	NA	0		--	--	--
					Replaced Tank with Lagoon	1953	36,800	0	36,800	0	7	--	--	--
					Extended Water & Sewer Lines	1970	e	e	0	0		No	No	No

(Continued)

APPENDIX TABLE 52. INVENTORY OF MUNICIPAL SEWAGE SYSTEMS, NORTH DAKOTA STATE REGION 8, (CONTINUED)

ounty by City	Population		Year Coll. was Installed	First Year Treatment Plant was Used	Construction Projects									
							Estimated Cost[b]							
	1960	1970			Description of Project	Year	Total Costs	Coll. System	Treatment Facilities	Amount of WPC or EPA[c] Grant	EPA Designation 1968[d]	Federal Financing FHA Loan	FHA Grant	Other Grants
Sentinel Butte	160	125	--	--										
ettinger														
Mott	1,463	1,368	1928	1928	Coll. System Septic Tank	1928	NA	NA	NA	0		--	--	--
					Replaced Tank with Lagoon	1957	40,240	0	40,240	12,030	7	--	--	WPC
New England	390	354	1948	1948	Coll. System, Imhoff Tank	1948	NA	NA	NA	0	4	--	--	--
					Extended Sewer Lines	?	8,010	8,010	0	0		--	--	--
Regent	388	344	1937	1937	Coll. System, Imhoff	1937	NA	NA	NA	0	4	--	--	--
one														
Amidon	84	54	--	--										
Marmarth	319	247	1917	1917	Coll. System, Septic Tank	1917	NA	NA	NA	0	4	--	--	--
ark														
Belfield	1,064	1,130	1946	1946	Coll. System, Imhoff Tank	1946	NA	NA	NA	0				
					Replaced Tank with Lagoon	1967	38,620	0	38,620	11,590	7	No	No	WPC
					Extended Water & Sewer Lines	1961	e	e	0	0		--	--	--
					Extended Sewer Lines	1963	2,000	2,000	0	0		--	--	--
					Extended Water & Sewer Lines	1969	e	e	0	0		No	No	No
Dickinson	9,971	12,405	1907	1935	Coll. System Raw to Heart R.	1907	NA	NA	NA	0		--	--	--
					Secondary Treatment Plant	1935	NA	NA	NA	0		--	--	--
					Constructed Lagoon	1957	205,710	0	205,710	61,700	7	--	--	WPC
					Extended Water & Sewer Lines Several Times during the	1960's	g	g	0	0		--	--	--
Gladstone	185	222	1963	1963	Coll. System, Lagoon	1962	38,700	28,130	10,500	3,170	7	--	--	WPC
Richardton	792	799	1936	1937	Coll. System	1936	NA	NA	0	0				
					Imhoff Tank	1937	NA	0	NA	0				
					Replaced Tank with Lagoon	1961	30,000	0	30,000	8,670	7	--	--	WPC
South Heart	97*	132	1970	1970	Coll. System, Lagoon	1970	91,000[f]	NA	NA	8,190	?	Yes	Yes	EPA
Taylor	215	162	1959	1959	Coll. System, Lagoon	1959	40,550	22,650	17,870	5,360	7	--	--	WPC

(Footnotes on Following Page)

APPENDIX TABLE 52. INVENTORY OF MUNICIPAL SEWAGE SYSTEMS, NORTH DAKOTA STATE REGION 8, (CONTINUED)

---

[a] Most of these data are from the U.S. Census of Population for 1960 and 1970. Figures in asterisk* are from Rand-McNalley Commercial Atlas and Marketing Guide, 1961 and 1972, Edition.

Unless otherwise noted, the figures given are cost estimates made by engineers in the Water Supply and Pollution Control Division, North Dakota State Department of Health, from the amounts in contract awards, plus 15 percent to cover costs of land, right-of-way, engineering, planning, and legal work.

There are now known as "EPA Grants".

Code members for 1968 EPA designations are as follows:
0 Needs new treatment facilities (had none in 1968).
1. Need enlargement of existing facilities.
2 Needs addition of other treatment methods to existing facilities.
3 Needs chlorination.
4 Existing plant should be closed, because it is obsolete.
5 Improved operation or utilization of existing facilities is all that would be needed.
6 Should be connected to an adequate existing sewer system.
7 No project is needed.

Cost data of Water Supply and Pollution Control Division are not separated between water and sewer projects. See "Inventory of Water Systems", for total construction costs or both water and sewage projects.

Cost estimates made by State Office of FHA.

Cost estimates are not readily available in Office of Water Supply and Pollution Control Division.

The 1960 population estimate was made by the North Dakota Industrial Development Commission.

APPENDIX TABLE 53. INVENTORY OF MUNICIPAL AND COMMUNITY WATER SYSTEMS IN NORTH DAKOTA STATE REGION 7 CITIES AND VILLAGES WITH 1960 POPULATIONS OF 75 TO 10,000 AS OF SEPTEMBER 1, 1972

	Population[a]		First Year Of Operation	Earliest Year Treatment Facilities Were Used	Construction Projects			Federal Assistance			Treatment Facilities
	1960	1970			Description of Project	Year	Estimated Cost[b]	FHA Loan	FHA Grant	Office Grant	
Burleigh											
Regan	104	74	--	--							
Wing	303	223	1968	1968	Well, distribution system, elevated storage	1967	111,000[e]	Yes	Yes	No	Chlorination
Wilton	739	695	1918	--	2 Wells (160',150'), distribution system	1918	NA	--	--	--	None
					3 additional wells prior to 1943		NA	--	--	--	
Emmons											
Braddock	141	106	--	--							
Hague	197	146	1968	1968	Well, distribution system, 2500 gal. pressure tank	1968	61,550	Yes	Yes	No	Chlorination
Hazelton	451	374	1955	?	Well and distribution system	1955	NA	--	--	--	Hypochlorites
Linton	1826	1695	1926	?	3 Wells (30',80'), distribution system	1926	NA	--	--	--	?
					Additional well	1948	NA	--	--	--	?
					150,000 gal. concrete storage and other improve	1970	99,850	No	No	--	
					Treatment plants and other improvements	1971/2	33,200	No	No	--	
Strausburg	612	642	1947	?	Well, distribution system	1947	NA	--	--	--	Hypochlorites
Grant											
Carson	501	466	1947	--	Well and distribution system	1947	NA	--	--	--	None
					Additional wells drilled	1950	NA	--	--	--	None
Elgin	944	839	1919	--	156' well and distribution system	1919	NA	--	--	--	None
					2 additional wells drilled	1946	NA	--	--	--	
Leith	100	92	--	--							
New Leipzig	390	354	1928	--	Well (431'), distribution system	1928	NA	--	--	--	None
					2 additional wells drilled	1938	NA	--	--	--	
Kidder											
Dawson	206	131	--	--							
Pettibone	205	173	--	--							
Robinson	155	125	1969	1969	Well, distribution system, underground storage		53,000[e]	Yes	Yes	No	Chlorination

cont.

APPENDIX TABLE 53. INVENTORY OF MUNICIPAL AND COMMUNITY WATER SYSTEMS IN NORTH DAKOTA STATE REGION 7 (CONTINUED)

	Population[a]		First Year Of Operation	Earliest Year Treatment Facilities Were Used	Construction Projects			Federal Assistance			Treatment Facilities
	1960	1970			Description of Project	Year	Estimated Cost[b]	FHA Loan	FHA Grant	Office Grant	
Steele	847	696	1936	1952	3 wells, distribution system	1936	NA	--	--	--	Soda-ash
					Chlorinator	1952	NA	--	--	--	Zeolite filter
					Iron-removal facilities	1956	NA	--	--	--	Hypochlorites
Tappen	326	294	--	--							
McLean					Constant pressure pump and reserve						
Benedict	129	72	1968	1968	Well distribution system	1968	53,000[e]	Yes	Yes	--	Chlorination
Butte	257	193	--	--							
Coleharbor	210	78	1965	--	Well and distribution system	1965	NA	--	--	--	
					New well, pumphouse, additional main	1968	14,640	Yes	Yes	No	None
Garrison	1794	1614	1917	1945	2 wells (125' and 144'), distribution system	1917	NA	--	--	--	Chlorin. gas
					2 additional wells, treatment plant	1945	NA	--	--	--	Chlorin. gas
					Extended water and sewer lines	1962	9,010[c]	--	--	--	Chlorin. gas
					Extended, water and sewer lines	1963	NA	--	--	--	Chlorin. gas
					Additional well	1971	22,825	No	No	No	Chlorin. gas
Max	410	301	1954	1954	Dug well, distribution system	1954	NA	--	--	--	Zeolite filter
											Hypochlorites
Mercer	154	132	1952	--	Well and distribution system	1952	NA	--	--	--	None
Turtle Lake	792	712	1937	--	3 wells, distribution system	1937	NA	--	--	--	
					New well	1969	3,070	No	No	No	None
					Extended water lines, 1961-1971		56,790[c]	No	No	No	
Underwood	819	781	1946	--	Wells, distribution system	1946	NA	--	--	--	None
Washburn	993	804	1920	1939	Well, distribution system	1920	NA	--	--	--	Sedimentation
					Pumping plant on Missouri R., treatment plant	1939	NA	--	--	--	Free Residual Chlor.
Mercer											
Beulah	1318	1344	1929	1962	176' well and distribution system	1929	NA	--	--	--	Sulfening limesoda
					2 additional wells drilled	1952	NA	--	--	--	Aeration, recarb.
					Treatment plant	1961	197,740	--	--	--	Gravity filter
					Improvements to water and sewage systems	1963	18,510[c]	--	--	--	Chlorine Gas
Golden Valley	286	235	1968		Well distribution system 50,000 gal. Concrete, reservoir	1969	86,000	Yes	Yes		Chlorination

cont.

APPENDIX TABLE 53. INVENTORY OF MUNICIPAL AND COMMUNITY WATER SYSTEMS IN NORTH DAKOTA STATE REGION 7 (CONTINUED)

	Population[a]		First Year Of Operation	Earliest Year Treatment Facilities Were Used	Construction Projects			Federal Assistance			Treatment Facilities
	1960	1970			Description of Project	Year	Estimated Cost[b]	FHA Loan	FHA Grant	Office Grant	
Hazen	1222	1240	1917	1939	2 wells, distribution system	1917	NA	--	--	--	Zeolite filter
					Treatment plant	1929	NA	--	--	--	Chlorination
					Additional well	1945	NA	--	--	--	Aeration
					Concrete, underground storage, clean out well, new pump house, pumps, chlorinator, aerator	1968	87,280^{e}	No	No	--	
Pick City	101	119	1965	1965	Well and distribution system	1965	47,000^{e}	Yes	No	No	Chlorination
Stanton	409	517	--	--							
Zap	339	271	1949	1969	Well distribution system	1949	NA	--	--	--	
					Rebuilt entire system including new well, and elevated storage	1969	80,000^{e}	Yes	Yes	No	Chlorination
Morton											
Almont	190	190	1958	--	2 wells, distribution system	1958	NA	--	--	--	None
Flasher	515	467	1952	--	3 wells, distribution system	1952	NA	--	--	--	None
Glen Ullin	1210	1070	1910	--	2 wells, distribution system	1940	NA	--	--	--	None
					100,000 gal. concrete reservoir	1961	22,830	--	--	--	
Hebron	1340	1103	1929		2 wells (238', 424') distribution system	1929	NA	--	--	--	None
					New well	1941	NA	--	--	--	
New Salem	986	943	1940	--	2 wells (320'), distribution system	1940	NA	--	--	--	None
Oliver											
Center	476	619	1960	--	2 wells and distribution system	1960	NA	--	--	--	None
					Additional mains 50,000 gal elevated tank	1961	96,020	--	--	--	
Sheridan											
Goodrich	392	300	1918	--	580' well, distribution system	1918	NA	--	--	--	None
McClusky	751	664	1911	?	2 wells (22', 430'), distribution system	1911	NA	--	--	--	Chlorine gas
					Treatment facilities	NA	NA	--	--	--	
Martin	146	120	--	--							

cont.

APPENDIX TABLE 53. INVENTORY OF MUNICIPAL AND COMMUNITY WATER SYSTEMS IN NORTH DAKOTA STATE REGION 7 (CONTINUED)

	Population[a]		First Year Of Operation	Earliest Year Treatment Facilities Were Used	Construction Projects			Federal Assistance			Treatment Facilities
	1960	1970			Description of Project	Year	Estimated Cost[b]	FHA Loan	FHA Grant	Office Grant	
Sioux											
Fort Yates	921*[d]	1153	1930	1930	Pumping and treatment plant (Missouri R.) and distribution system	1930	NA	--	--	--	
					2 wells and treatment plant	1965	434,700	No	No	--	
					Additions to water system	1967	24,396	--	--		
					Additions to distribution system, fire hydrants	1969	24,070	No	No		
					Improvements and extentions, water & sewer lines	1970	227,212[c]	Yes	No	EDA	
					300,000 gal. underground storage tank	1972	51,600	No	No		
Selfridge	371	346	1957	--	Wells and distribution system	1957	NA	--	--	--	None
Solen	250*	180	1971	1971	Well, distribution system, elevated storage	1971	83,000[e]	Yes	No	EDA	Chlorination

[a] Most of data are from U.S. Census of Population for 1960 and 1970. Figures with asterisk are from Rand-McNalley Commercial Atlas and Marketing Guide for 1961.

[b] Unless otherwise noted, the figure given is a cost estimate made by engineers in the Water Supply and Pollution Control Division of North Dakota State Public Health Department from the amounts in contract awards, plus 15 percent to cover costs of land, rights-of-way, engineering, planning, and legal work.

[c] Cost estimates include construction work on sewage system, as well as water system. Data available from Water Supply and Pollution Control Division do not permit apportioning of costs between sewage and water system.

[d] 1960 Population estimate, made by North Dakota Industrial Development Commission.

[e] Estimate made by Farmers Home Administration.

APPENDIX TABLE 54. INVENTORY OF MUNICIPAL AND COMMUNITY WATER SYSTEMS IN NORTH DAKOTA STATE REGION 8, CITIES AND VILLAGES WITH 1960 POPULATIONS OF 75 TO 10,000 AS OF SEPTEMBER 1, 1972

	Population[a]		First Year Of Operation	Earliest Year Treatment Facilities Were Used	Construction Projects			Federal Assistance			
	1960	1970			Description of Project	Year	Estimated Cost[b]	FHA Loan	FHA Grant	Office Grant	Treatment Facilities
Adams											
Haynes	111	53	--	--							
Hettinger	1760	1655	1919	1943	2 wells (400', 1152') distribution system	1919	NA	--	--	--	Hypochlorites
					2 wells and treatment facilities	1943	NA	--	--	--	Hypochlorites
					New well (1200')	1964	6,150	--	--	--	Hypochlorites
					New well (1200')	1965	25,800	No	No	--	Hypochlorites
					Extended water and sewer lines	1970	16,000[c]	No	No	--	Hypochlorites
Reeder	321	306	1946	1971	Well, distribution system	1946	NA	--	--	--	Chlorination
					Deep well, pump, pumphouse, replace mains	1971	77,000[e]	Yes	No	No	
Billings											
Medora	133	129	1964	?	Wells and distribution system	1963	66,270	--	--	--	?
					Drilled artesian well	1968	9,780	--	--	--	
Bowman											
Bowman	1730	1762	1931	?	1042' well and distribution system	1931	NA	--	--	--	Hypochlorites
					Additional wells	1938	NA	--	--	--	
					New pumphouse	1961	10,190	--	--	--	
					Extended water and sewer lines	1961	66,210[c]	--	--	--	
					Additional deep well	1967	33,940	No	No	--	
					Extended water and sewer lines	1968	17,841[c]	No	No	--	
Rhame	254	206	1918	--	Well (25') distribution system	1918	NA	--	--	--	None
					2 additional wells	1941	NA	--	--	--	
Scranton	358	360	1938	1968	Wells, distribtuion system	1938	NA	--	--	--	Chlorination
					New well (1100') chlorinator, connections	1968	27,570	No	No	No	
Dunn											
Dodge	226	121	--	--							
Dunn Center	250	107	--	--							
Hslliday	509	413	1953	--	Well and distribution system	1953	NA	--	--	--	None
Killdeer	765	615	1935	--	2 wells, distribution system	1935	NA	--	--	--	
					Additional wells	1941	NA	--	--	--	None

cont.

APPENDIX TABLE 54. INVENTORY OF MUNICIPAL AND COMMUNITY WATER SYSTEMS IN NORTH DAKOTA STATE REGION 8, (CONTINUED)

	Population[a]		First Year Of Operation	Earliest Year Treatment Facilities Were Used	Construction Projects			Federal Assistance			Treatment Facilities
	1960	1970			Description of Project	Year	Estimated Cost[b]	FHA Loan	FHA Grant	Office Grant	
Golden Valley											
Beach	1460	1408	1912	--	Well and distribution system	1912	NA	--	--	--	None
					Additional wells drilled	1939	NA	--	--	--	
					New pumphouse	1962	2,390	--	--	--	
					New well, extended water and sewer lines	1971	194,000[c]	No	No	--	
Sentinal Butte	160	125	--	--							
Hettinger											
Mott	1463	1368	1928	--	2 wells (13', 387') distribution system	1928	NA	--	--	--	None
					Additional well	1960	NA	--	--	--	
					Extended water and sewer lines	1968	2,950[c]	--	--	--	
					Extended water and sewer lines	1969/70	7,480[c]	--	--	--	
New England	1095	906	1914	?	Well (78'), distribution system	1914	NA	--	--	--	Hypochlorites
					Additional wells	1942	NA	--	--	--	
Regent	388	344	1937	1972	Well distribution system	1937	NA	--	--	--	
					Additional well	1951	NA	--	--	--	
					Well and transmittion line	1972	50,000[e]	Yes	No	No	Chlorination
Slope											
Amidon	84	54	--	--							
Marmarth	319	247	1917	--	Well(155'), distribution system	1917	NA	--	--	--	None
					New well drilled	1947	NA	--	--	--	
Stark											
Belfield	1064	1130	1929	?	230' well and distribution system	1929	NA	--	--	--	Hypochlorites
					New wells drilled in 1931 and 1939		NA	--	--	--	
					Extended water and sewer lines	1961	7,630	--	--	--	
					Extended water lines	1962	2,558	--	--	--	
					Extended water and sewer lines	1969	5,290	No	No	--	
Dickinson	9971	12,405	1907	1951	Wells and distribtuion system	1907	NA	--	--	--	Alum-Soda
					Heart river pumping plant	1950	NA	--	--	--	Sedimentation
					Treatment plant	1951	NA	--	--	--	Filter, Chlor gas
					Extended water lines several times during	1960's	NA	--	--	--	Fluorination
					New treatment plant and intake line	1967	1,488,300	NA	NA	--	
					New well	1963	8,190	--	--	--	

cont.

APPENDIX TABLE 54. INVENTORY OF MUNICIPAL AND COMMUNITY WATER SYSTEMS IN NORTH DAKOTA STATE REGION 8, (CONTINUED)

	Population^a		First Year Of Operation	Earliest Year Treatment Facilities Were Used	Construction Projects			Federal Assistance			Treatment Facilities
	1960	1970			Description of Project	Year	Estimated Cost^b	FHA Loan	FHA Grant	Office Grant	
Gladstone	185	222	1972	1972	Well and distribution system	1972	107,620	Yes	Yes	No	Chlorination
Richardton	792	799	1937	1972	2 wells, distribution system	1937	NA	--	--	--	
					Concrete underground storage and other improve	1972	100,000^e	Yes	No	No	Chlorination
South Heart	97*	132	1970	1970	Well, distribution system, pressure tank	1970	79,000^e	Yes	Yes	No	Chlorination
Taylor	215	162	1970	1970	Well, distribution system, pressure tank	1970	85,000^e	Yes	Yes	No	Chlorination

[a] Most of data are from U.S. Census of Population for 1960 and 1970. Figures with asterisk are from Rand-McNalley Commercial Atlas and Marketing Guide for 1961.

[b] Unless otherwise noted, the figure given is a cost estimate made by engineers in the Water Supply and Pollution Control Division of North Dakota State Public Health Department from the amounts in contract awards, plus 15 percent to cover costs of land, rights-of-way, engineering, planning, and legal work.

[c] Cost estimates include construction work on sewage system, as well as water system. Data available from Water Supply and Pollution Control Division do not permit apportioning of costs between sewage and water system.

[d] 1960 population estimate, made by North Dakota Industrial Development Commission.

[e] Estimate made by Farmers Home Administration.

APPENDIX B

ELECTRIC POWER PLANT AND COAL MINE WORK FORCE QUESTIONNAIRE

ELECTRIC POWER PLANT AND COAL MINE WORK FORCE QUESTIONNAIRE

DO NOT WRITE YOUR NAME ON THIS QUESTIONNAIRE. YOUR RESPONSES WILL REMAIN ANONYMOUS.

Directions: Please read and answer each of the following questions with the answer which best describes your situation. Fill in the blank or check the appropriate response.

1. Name of power plant or coal mine at which you work ______________________.

2. Name of county in which you live ______________________________.

3. Sex: ____Male ____Female

4. Your age: ________Years

5. Race: ____White ____Negro ____Other

    ____Indian ____Spanish American

6. Marital status: ____Married ____Separated ____Never married

    ____Divorced ____Widowed

7. Number of children living at home: __________

8. Where were you born?

    ____North Dakota

    ____Out of state

    ____Foreign country

9. Where do you live?

    ____On a farm. If a farm, how many acres? ________Acres

    ____Outside the city limits, but not on a farm.

    ____In a city under 500 population.

    ____In a city between 500-1,000 population.

    ____In a city between 1,000-2,500 population.

    ____In a city between 2,500-5,000 population.

    ____In a city between 5,000-10,000 population.

    ____In a city over 10,000 population.

10. How long have you lived in this community? ________Years

11. How long have you lived at your present address?

____Under 1 year

____1-3 years

____4-5 years

____5-10 years

____Over 10 years

12. Do you own or rent a home?

	Own	Rent
House------------------------------	_____	_____
Apartment--------------------------	_____	_____
Trailer home-----------------------	_____	_____
Condominium or town house----------	_____	_____
Other------------------------------	_____	_____

13. From where did you move to this community?

____Never have moved.

____Within the county you now reside.

____From another North Dakota county. Name of county ____________________.

____Out of state. Name of state ________________________________.

____Foreign country. Name of foreign country ____________________________.

____Other.

14. Formal education (exclude vocational training beyond high school):

____8 years or less

____9-11 years

____12 years

____13-15 years

____16 or more years

15. Vocational training (months):

____6 or less months

____7-12 months

____13-18 months

____19-24 months

____25 or more months

____Time unknown

____No vocational training

16. Type of vocational training, if any ________________________________.

NOW WE WOULD LIKE TO ASK SOME QUESTIONS ABOUT YOUR PRESENT EMPLOYMENT.

17. Job title of your present job ____.

18. Have you held more than one position with the company you are currently working for? ____Yes. If yes, how many positions? ________

____No.

19. How long have you worked with the company by which you are presently employed?

________Years

20. Have you been unemployed at any time during the past 12 months?

____Yes ____No

21. Yearly earnings at your present job:

____Less than $5,000

____$5,000-$5,999

____$6,000-$6,999

____$7,000-$7,999

____$8,000-$8,999

____$9,000-$9,999

____$10,000-$10,999

____$11,000-$11,999

____$12,000-$12,999

____$13,000-$13,999

____$14,000-$14,999

____$15,000-$15,999

____$16,000-$16,999

____$17,000-$17,999

____$18,000-$18,999

____$19,000-$19,999

____Over $20,000

22. How far do you travel (one-way) to get to work? ___________Miles

23. By what means of transportation do you travel to work?

____Privately owned car

____Car pool

____Public transportation

____Walk

____Other

24. How satisfied are you with your present job?

____Very satisfied

____Satisfied

____So-so

____Unsatisfied

____Very unsatisfied

THE NEXT FEW QUESTIONS CONCERN YOUR LAST EMPLOYMENT BEFORE WORKING FOR YOUR PRESENT EMPLOYER.

25. ____I have never worked for another employer.

26. Name of company where you were last employed ________________________________.

27. Job title of your last job ____.

28. Location of work:

____Within same county you now reside.

____In another North Dakota county.

____In another state.

____Other.

29. Total years of employment with previous employer? ________Years

30. How far did you travel to work in your last job? ________Miles

31. Reason for leaving your past employment. ____________________________________

____

32. Yearly earnings of last job at time of leaving:

____Less than $5,000

____$5,000-$5,999

____$6,000-$6,999

____$7,000-$7,999

____$8,000-$8,999

____$9,000-$9,999

____$10,000-$10,999

____$11,000-$11,999

____$12,000-$12,999

____$13,000-$13,999

____$14,000-$14,999

____$15,000-$15,999

____$16,000-$16,999

____$17,000-$17,999

____$18,000-$18,999

____$19,000-$19,999

____Over $20,000

33. What was the difference between your yearly earnings at your last job and your starting salary with your present energy-related company? $__________

APPENDIX C

SURVEY OF HEAD OF HOUSEHOLDS IN MERCER COUNTY

SURVEY OF THE HEAD OF HOUSEHOLDS
IN MERCER COUNTY

DO NOT WRITE YOUR NAME ON THIS QUESTIONNAIRE. YOUR RESPONSES WILL REMAIN ANONYMOUS.

Directions: Please read and answer each of the following questions with the answer which best describes your situation. Fill in the blank or check the appropriate response.

1. Where were you born?
   _____ North Dakota
   _____ out of state, which state ______________________
   _____ foreign country, which country __________________

2. How many years have you lived in this community? _______ years

3. From where did you move to this community?
   _____ never have moved
   _____ within the county in which you now reside
   _____ from another North Dakota county--name of county ______________
   _____ out of state, which state__________
   _____ foreign country, which country ______________
   _____ other

4. How long have you lived at your present address?
   _____ under one year
   _____ 1-3 years
   _____ 3-5 years
   _____ 5-10 years
   _____ over 10 years

5. Where do you live?
   _____ on a farm
   _____ outside the city limits, but not on farm
   _____ in a town under 500 pop.
   _____ in a town between 500-1,000 pop.
   _____ in a town over 1,000 pop.

6. I _____ own / _____ rent my residence, which is a
   _____ house
   _____ apartment
   _____ condominium or townhouse
   _____ trailer
   _____ other

7. How many people live in your household? ____________

8. How long have you worked at your present job? ________ year(s)

9. Have you been unemployed at any time during the past 12 months? _____yes _____no

10. Yearly earnings at your present job?
    _____ Less than $5,000
    _____ $5,000-$5,999
    _____ $6,000-$6,999
    _____ $7,000-$7,999
    _____ $ 8,000-$ 8,999
    _____ $ 9,000-$ 9,999
    _____ $10,000-$11,999
    _____ $12,000-$14,999
    _____ $15,000-$19,999
    _____ over $20,000

11. How satisfied are you with your present job?

    _____ very satisfied _____ satisfied _____ so-so _____ unsatisfied _____ very unsatisfied

    Why?

12. How many member(s) of your household are under 16? ___________

13. We would like to have some idea of the makeup of your household, starting with yourself, the head of household (on first line). Please use a line for each of the household members (wife, son, etc.). Fill in for everyone in your household over 16 years of age.

Relationship to Household Head	Age	Sex	Job Title (if working)	Years of Education	Vocational Training		Special Job Skills (be as specific as possible)
					No. of Months	Type	
Household Head							

14a. If development of the coal resources (mining power plants, gasification plants, etc.) were to expand in Mercer County, would you be interested in employment in that industry? Yes_____ No_______

Because ____

____ Do not know, would need further information regarding __________________

____

14b. Would you or other member(s) of your household be interested in employment in the coal industry? If so, list the type of job that would appeal to you and/or other family members? Use one line for yourself and each other member of the family over 16 years of age.

Family Member	Interested in Employment			If yes, type of job (be as specific as possible)	Would you have to quit your present employment?
	Yes	No	Don't Know		
Household Head					

15a. If such development were to occur so that more jobs were created in the community, in addition to those in the coal industry, would you be interested in such employment? Yes_____ No_____

Because ____

_____ Do not know, would need further information regarding __________________

____

15b. Would you or other member(s) of your household be interested in employment in a job created in your community indirectly as a result of the coal industry? If so, list the type of job that would appeal to you and/or other family members? Use one line for yourself and each other member of the family over 16 years of age.

Family Member	Interested in Employment			If yes, type of job (be as specific as possible)	Would you have to quit your present employment?
	Yes	No	Don't Know		
Household Head					

16. In what size city would you most prefer to live?

_____ farm
_____ less than 500 population
_____ between 500-1,000 population
_____ between 1,000-2,500 population
_____ between 2,500-5,000 population
_____ between 5,000-10,000 population
_____ between 10,000-25,000 population
_____ 25,000-50,000 population
_____ 50,000-100,000 population
_____ over 100,000 population

17. Now we would like you to rank the following community services by how important these services are to you in determining where you would most prefer to live. Check the appropriate response for each service.

Community Service	ESSENTIAL Would not Prefer to Live in Town Without This Service	DESIRABLE Would Prefer to Have Service Within a Short Drive of Where I Live (less than one hour drive)	NOT ESSENTIAL As Long As Service is Within a Half Day Drive from Where I Live
Hospital	_____	_____	_____
Resident Doctor (but not hospital)	_____	_____	_____
High School	_____	_____	_____
Grade School	_____	_____	_____
Cafe	_____	_____	_____
Small Grocery Store	_____	_____	_____
Shopping Center	_____	_____	_____
Dentist	_____	_____	_____
Human Services (psychiatrist, social services, etc.)	_____	_____	_____
Barber	_____	_____	_____
Bank	_____	_____	_____
Drugstore	_____	_____	_____
Golf Course	_____	_____	_____
Municipal Airport	_____	_____	_____
Automobile Dealer	_____	_____	_____
Womens or Mens specialty clothes	_____	_____	_____